

DIESEL ENGINES • DUAL FUEL ENGINES • NATURAL GAS ENGINES • GAS TURBINES

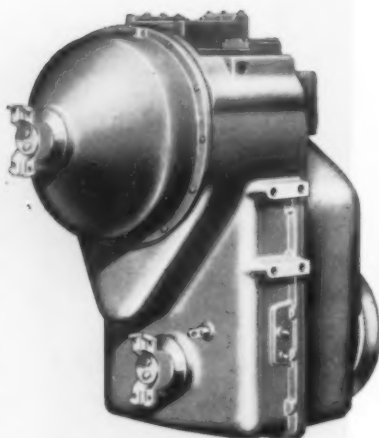
DIESEL GAS ENGINE PROGRESS



FIVE DOLLARS PER YEAR

SEPTEMBER, 1960

FIFTY CENTS PER COPY



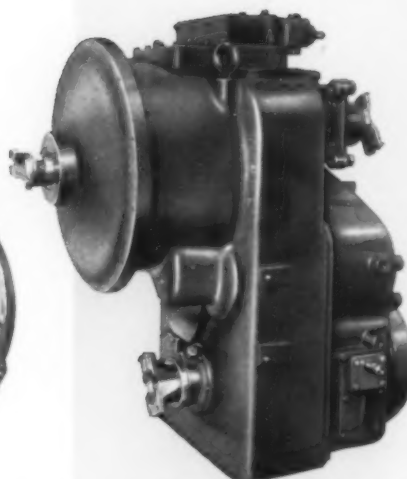
HYDRA-DRIVES
BDB
Transmission

- Four speeds forward and reverse.
- Full power shifting.
- For equipment up to 175 h.p.



HYDRA-DRIVES
Torque Converter

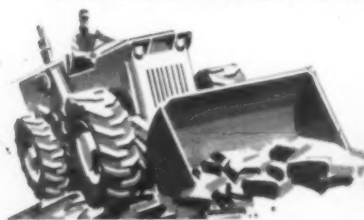
- 3-to-1 torque multiplication.
- Available separately, or with Hydra-Drives Transmission.
- For vehicles up to 500 h.p.



HYDRA-DRIVES
CDB
Transmission

- Four speeds forward and reverse.
- Power shift in each range both forward and reverse.
- For equipment up to 250 h.p.

PEAK POWER OUTPUT FOR HEAVY-DUTY EQUIPMENT...



Hydra-Drives[®]

Power Shift Transmissions and Torque Converters

Rockwell-Standard's Hydra-Drives units make hard work easy for heavy-duty equipment. The result . . . smooth, efficient, economical operation. A torque converter and 4-speed transmission in one compact package, the Hydra-Drives Power Shift Transmissions have been proved in hundreds of vehicles. They eliminate engine lugging and heavy shock loads. A 3-to-1 torque multiplication makes starting fast and effortless — even with heaviest loads.

Just a flip of the operator's lever accomplishes power shifts without interruption of the power flow.

Automatic features of the converter and ease of power shifting simplifies operator training and lengthens vehicle life.

With four speeds forward and reverse, the Hydra-Drives Power Shift Transmissions are ideally suited for vehicles which must travel in both directions during a normal work cycle.

Hydra-Drives Torque Converters are the simplest, most efficient made. They can be matched with any transmission for easier, more efficient operation.

Another Product of...

ROCKWELL-STANDARD
CORPORATION



Transmission and Axle Division, Detroit 32, Michigan

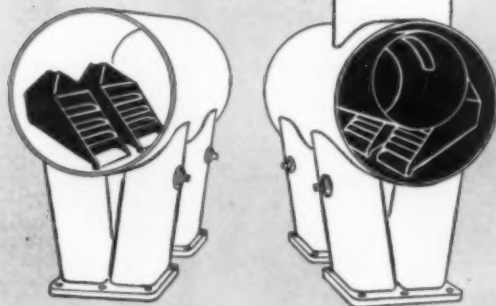
EASIER INSTALLATION...LESS DOWNTIME!

AIR-MAZE

spark arrester conversion kits!

FOR DIESEL LOCOMOTIVES

Air-Maze Kit
for EMD manifold



Air-Maze Spark Arrester Kits eliminate the need for obtaining a new manifold to get effective spark control. Deflecting vanes can be simply installed in original manifold during routine engine shopping. Simplified design minimizes number of man hours required for conversion . . . alignment problems sometimes encountered with fitting and welding are minimized.

The Air-Maze Spark Arrester is designed for use with the exhaust manifolds of both EMD and FM switcher and road units. It operates on the principle of centrifuging incandescent particles to reduce their size and temperature before they are exhausted. The addition of the Air-Maze Spark Arrester Kit does not affect engine performance.

Air-Maze Kit for FM manifold



AIR-MAZE
CLEVELAND 28, OHIO

A SUBSIDIARY OF ROCKWELL-STANDARD



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THAT NEVER FAILS!**

**NEW OAK ISLAND LIGHTHOUSE DEPENDS ON
HARRISON-COOLED DIESEL GENERATOR
FOR POWER IN EMERGENCIES!**

Cape Fear no longer haunts the seamen who ply the Atlantic Coastal Waters off North Carolina! Oak Island Lighthouse—newest and most powerful in the United States—gives ample warning of the dangerous shoals through rotating lights and a radio signal. A GM Diesel-powered standby generator set insures that the 14,000,000 candle-power light and the radio beam shall never fail in foul weather! And a Harrison heat exchanger cools the engine oil on this reliable generating equipment. Harrison—with a half century of experience in the heat-control field—assures you of top-quality products that are researched and engineered to control vital temperatures with maximum efficiency. The most advanced industrial, aviation and marine equipment relies on Harrison heat exchangers. If you have a cooling problem . . . look to Harrison for the answer.



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of General Motors Research and Engineering.



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DIESEL GAS ENGINE PROGRESS

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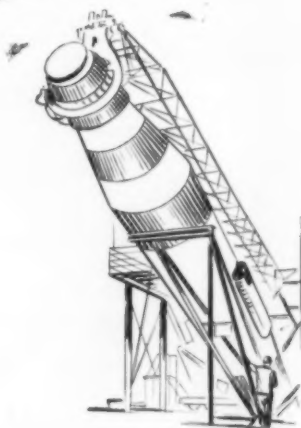
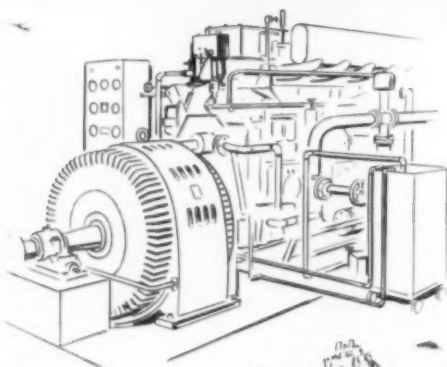
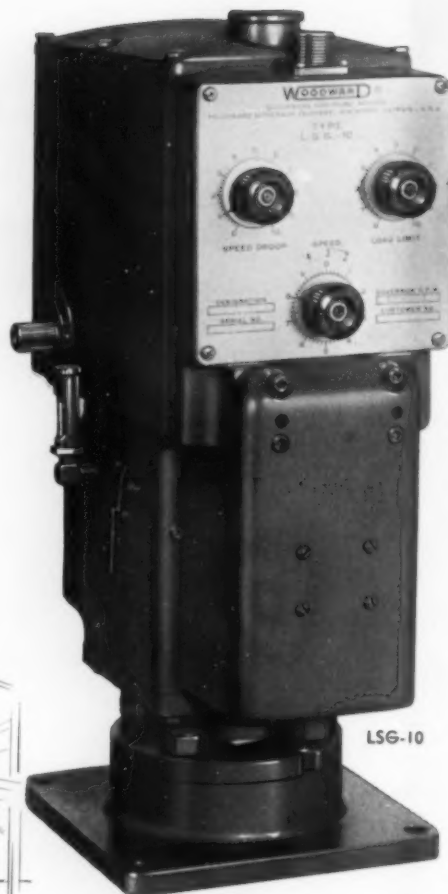
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necticut River for In-
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LOAD-SENSING
GOVERNORS**



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reliability
is required...*

Woodward type LSG governors provide the most precise engine speed control ever obtained. Transit time for the smaller one foot-pound LSG-1 governor is approximately 1/100th of a second . . . the larger ten foot-pound LSG-10 approximately 1/40th to 1/50th of a second. This transit time is so fast that the fuel pumps on all but the highest speed two cycle engines are in their new position before the next cylinder is ready to receive its fuel. System speed remains constant regardless of load. Steady state speed control is excellent. While the load-sensing portion of the LSG is electric, the engine is under complete speed governor control at all times. If electrical trouble such as loss of generator excitation, short circuits or damage to the load-sensing circuitry should occur, the speed governor will continue to control the engine with precision and safety. Write for information on Woodward type LSG load-sensing governors for your application.



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WORLD'S OLDEST AND LARGEST MANUFACTURER OF HYDRAULIC GOVERNORS EXCLUSIVELY



Report from James Roberts, Chief Engineer, Galion Iron Works & Manufacturing Co., Galion, Ohio.

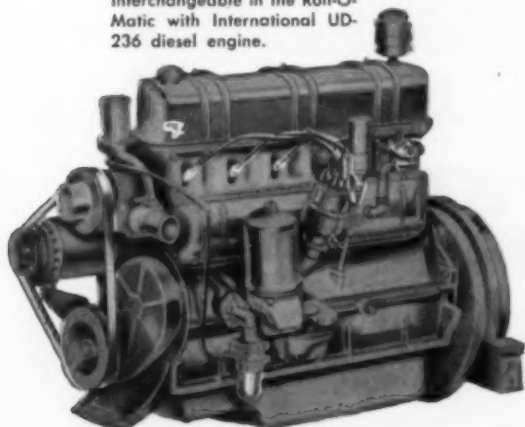
"We chose IH power for our pneumatic tire rollers because the wide speed range and favorable torque-speed curve of the International engines make it possible to have low-speed controlled operation for compacting, plus high-speed operation for traveling between jobs," says Mr. Roberts. "Other reasons we chose International were fast parts and service coverage, and operating economy."



GALION'S power choice for new Roll-O-Matic based on 30-year experience with INTERNATIONAL

After specifying IH engines in their road-building equipment for over 30 years, Galion engineers are more convinced than ever of the sale-clinching, profit-building advantages of International power. This long and satisfactory experience shows that 1) International's wide range of power sizes, with features for extreme adaptability in every size, pre-

International UB-220 carbureted engine shown here is interchangeable in the Roll-O-Matic with International UD-236 diesel engine.



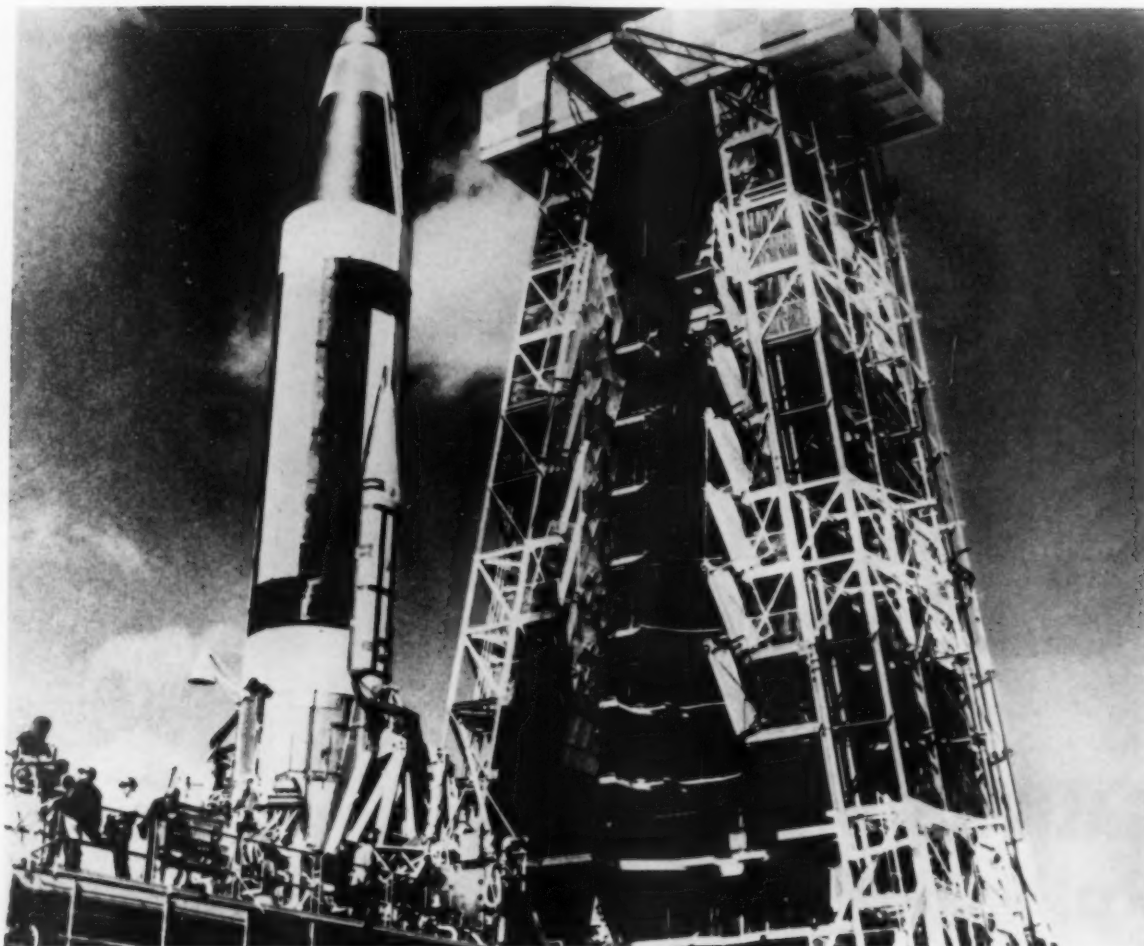
sents a choice that will exactly match design specifications and power requirements. 2) International's world-wide network of parts and service facilities assures prompt attention to on-the-job problems—any time, any place. 3) Galion customers are assured of long-lasting, low-cost power in their road-building equipment. That's why Galion engineers specify IH engines for products like their new 9-wheel, 12-ton, self-propelled, Roll-O-Matic shown above. This new roller, like other Galion products, offers a choice of IH gasoline or diesel power.

When selecting the engine to power your products, check into the complete International engine line—14 carbureted models, 10 diesels, from 16.8 to 385 max. hp. You'll like the one common feature of all 24 engines: fastest payback power for users. Just call or write International Harvester Co., Engine Sales Department, Construction Equipment Division, Melrose Park, Ill.

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The Atlas 12-A, the free world's first operational ICBM, on the test stand.

BENDIX FUEL INJECTION HELPS SUPPLY DEPENDABLE ELECTRIC POWER FOR HUGE ATLAS MISSILE COMPLEX

In dealing with \$2 million space age "birds," only the best is good enough!

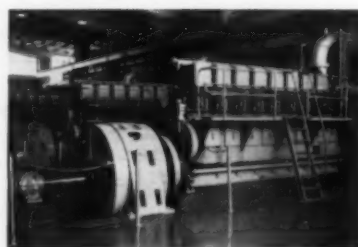
An example is the heavy responsibility placed on six mighty Nordberg diesel engines, sole power supply for the Atlas missile complex at Vandenberg Air Force Base, California. These engines must guarantee sufficient stable current to launch, guide and track our country's Atlas missiles.

Bendix* Diesel Fuel Injection Equipment shares in this vital work,

providing always-dependable fueling for the engines. Where extreme conditions call for superior equipment, Bendix is the choice. Today, more diesel engine manufacturers are specifying Bendix than ever before in history.

Bendix Diesel Fuel Injection Systems are equally dependable in locomotive, stationary or marine engines. If you have an application calling for the utmost in reliable performance, you can consult with Bendix in complete confidence.

*Reg. U. S. Pat. Off.



One of the six Nordberg diesels at Vandenberg. Each engine has 1344 hp rating at 450 rpm. All are served by Bendix Fuel Injection Pumps.

Scintilla Division

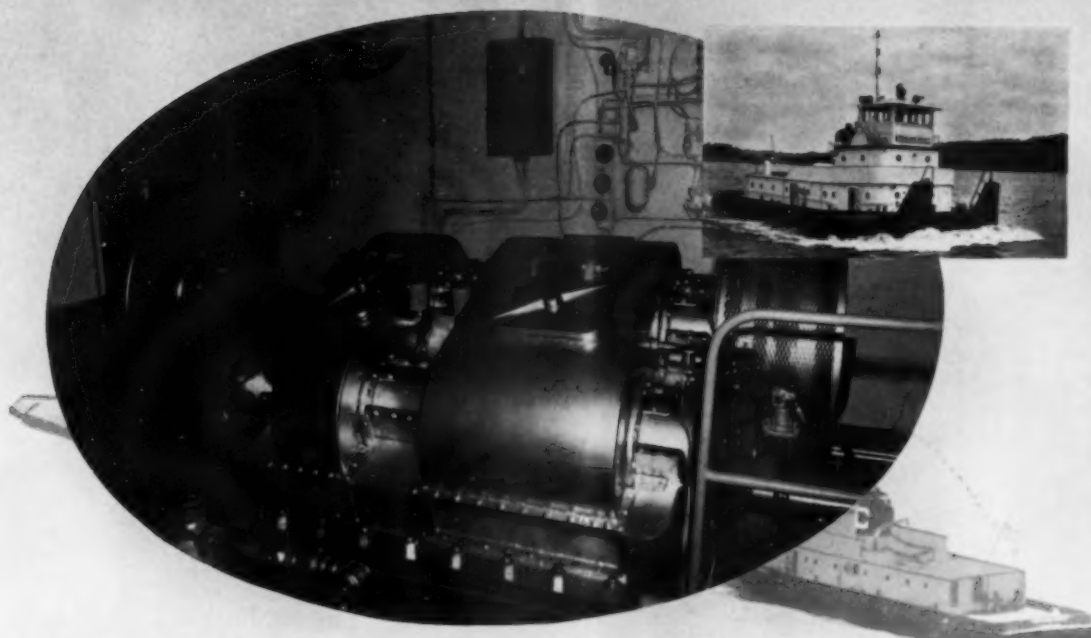
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HOW WESTERN GEAR SERVES THE MARINE INDUSTRY

Another money-maker launched, carrying *Sea-Master* WESTERN GEAR PCMR Reverse and Reduction Gears

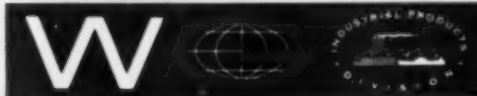


Western Gear's unique Sea-Master PCMR (pneumatic clutch marine reverse) gears were selected for the first push-type towboat, specifically designed for modern Hudson River requirements. ■ Launched at Dravo Corporation's Wilmington, Delaware yard, the "Rockland County" will push up to 20 loaded barges for Cornell Steamboat Company, subsidiary of New York Trap Rock Corp. The "Rockland County" is powered by two Fairbanks-Morse diesel engines which drive twin screws through Western Gear Model 80 PCMR-A reverse and reduction gears with Wichita pneumatic clutches.

HERE'S WHY WESTERN GEAR SEA-MASTER PCMR WAS SELECTED FOR "ROCKLAND COUNTY."

- (1) Quill shaft drive, pioneered by Western Gear Corporation...
 - (a) solves misalignment problems
 - (b) provides "soft" drive for eliminating torsional problems
- (2) Outside clutch location, pioneered by Western Gear Corporation...
 - (a) provides better cooling
 - (b) simplifies service
 - (c) assures positive alignment through integral gear clutch mounting
- (3) Split-sleeve type journal bearings...
 - (a) guarantee long life
 - (b) allow easy inspection and maintenance
 - (c) assure high efficiency
 - (d) have proven dependability
- (4) Simplified installation...
 - (a) Exclusive Western Gear 3-point alignment system makes accurate alignment of gear housing, engine and propeller shaft easy.
 - (b) Costly sub-bases, pillow blocks, stub shaft, etc. eliminated.

There's only one Western Gear Sea-Master PCMR gear. Accept no imitations or second bests.



For the full, unique story of PCMR, write, wire or phone for Marine Bulletin #5905. **WESTERN GEAR CORPORATION** Industrial Products Division, P. O. Box 126, Belmont, California. LYtel 3-7611

On the long run... QUALITY COSTS YOU LESS!

SHOVEL BY LORAIN/CATERPILLAR ENGINE POWER



* Fourth of a series

PROTECT YOUR MACHINE'S PERFORMANCE... YOUR CUSTOMER'S EARNINGS WITH CATERPILLAR ENGINES

Unlike tractors, crushers and other construction machines are frequently offered with a choice of several makes of engine. It's important to Equipment Manufacturers that the recommended engine is one that complements the performance of the machine. It's also very important to the contractor because his profitability depends on the performance of the machinery he buys.

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When an Original Equipment Dealer sells Cat Engines in crushers, excavators, batch plants, and other construction machinery, it helps him gain and maintain the kind of reputation that builds repeat business.

Write today for the handbook type booklet, Form DN4061. It shows why contractors have been specifying Cat Engines for 30 years. Information in the booklet on Cat Engines is useful to Equipment Manufacturers and their dealers and customers.

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- Assurance of machine performance
- Service and parts available throughout the free world
- Excellence of design, material and workmanship

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WITH
SMALLER
TURBOCHARGERS



AiResearch's new line of high performance turbochargers gives higher air pressures and more flow per size and weight than ever before achieved in the turbocharging industry, while retaining the high standards of durability which AiResearch established in this field.

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Your inquiries are invited.



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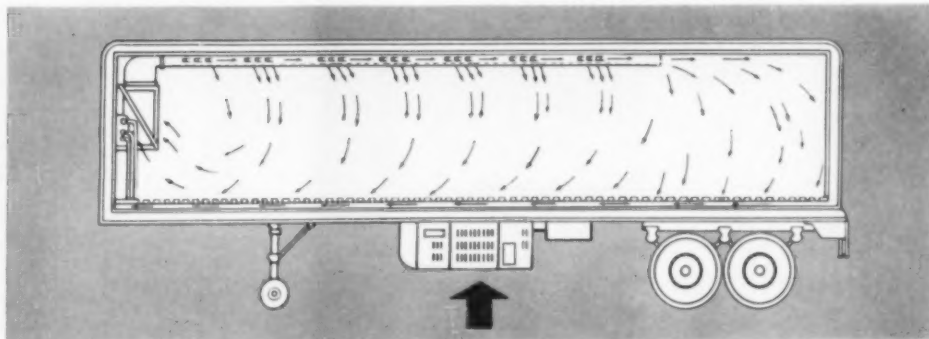
DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS



MERCEDES-BENZ

DIESEL ENGINES HELP MAKE WEATHER ON WHEELS

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"They have to be light and compact, fume-free, fully adaptable to our heating-cooling equipment, and—naturally—economical to operate," says M. B. Green, Thermo King Executive Vice President.

"Mercedes-Benz engines meet our needs to a 'T' These units give us the utmost in economical and dependable diesel power.

"Moreover, we have found that the Mercedes-Benz name and reputation have given additional sales appeal to our product."

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an element here
 and an element here
 assures 99.98%
 filtration efficiency
 even when 1 element
 is out of operation

IT'S THE NEW PUROLATOR TWO-STAGE FILTER

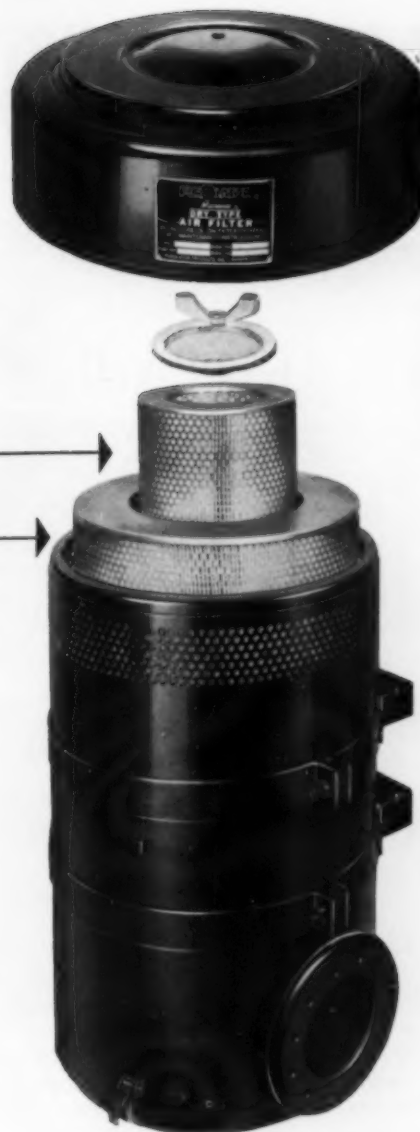
Simplicity of design makes the first cost of Purolator's new dry-type two-stage filter as low as any two-stage filter on the market. Each element filters independently, and together they dustproof your engine as no other filter can . . . 99.98% efficient.

Users save money and get better engine protection from this new Purolator filter, too. The first stage element will last up to 2000 hours, depending on operating conditions. The second stage will usually last almost indefinitely if the first element and sealing gaskets are maintained properly.

Another big user-advantage is the way the two-stage design protects the engine despite accidental mishandling of the element. Even if the first stage element is damaged, the chance of harming the engine can be discounted when it is protected with the second stage back stop element. In addition, the second stage element lets the operator service the unit in the field, regardless of how dusty the conditions are.

Both elements filter uniformly, in depth, over their whole surface, because they're both precision made of plastic impregnated cellulose. This series of two-stage filters is rated from 450 to 1150 cfm, with exceptionally low initial restriction. Mounting straps, rainhoods and outlet adapters are available.

For more information write to Purolator Products, Inc., Department 3896, Rahway, New Jersey.



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Please send me complete data on the new Purolator two-stage filter series.

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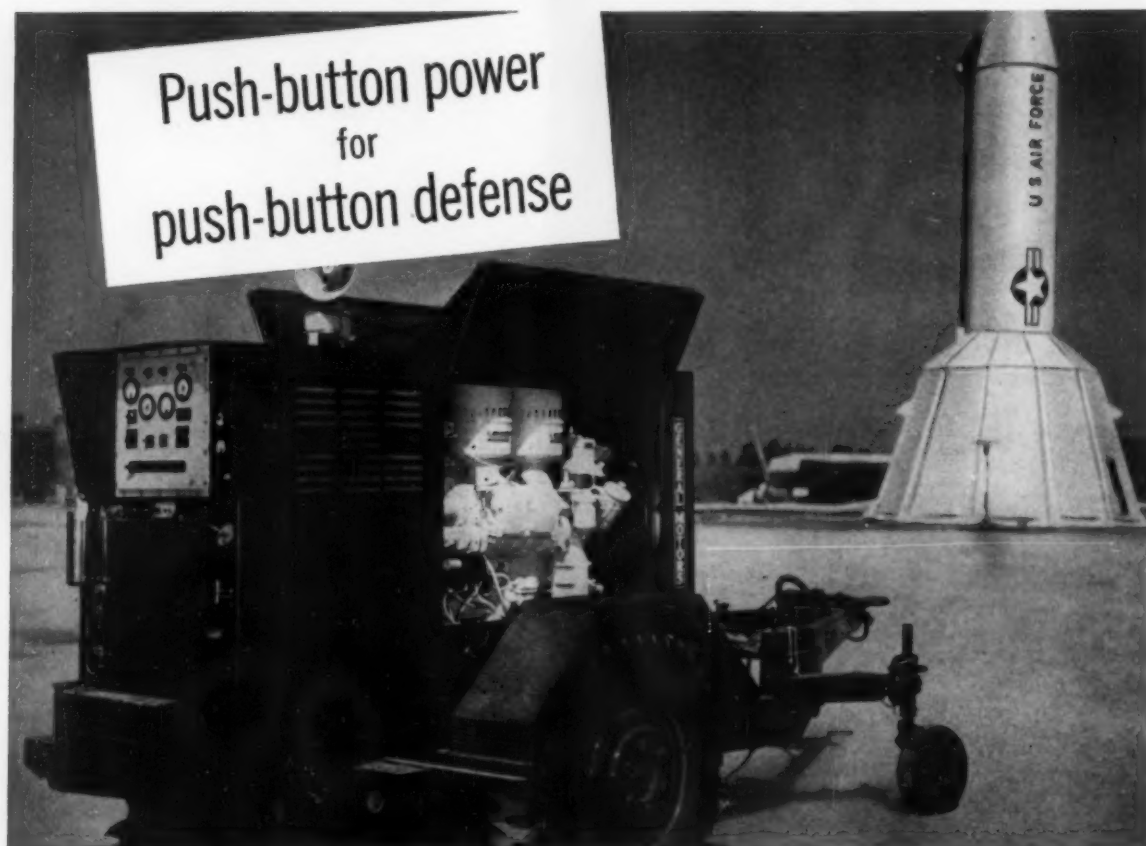
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GET REAL PRODUCTIVITY—GET A GM DIESEL



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You'll see a compact, 5,800-pound mobile unit that combines the time-proved GM "6-71" Diesel engine with a 100-KW. Delco generator set equipped with a specially designed regulating system for utmost accuracy.

You'll see a set that starts and operates in -65° ambient . . . that's arranged for remote starting . . . with a load-sensing hydraulic governor on the engine.

And you'll see a generator set that operates satisfactorily on either Diesel or

JP fuels because, unlike some 4-cycle Diesels, GM unit injectors do not require fuel oil with high lubricating qualities.

Developed in conjunction with the U.S. Army Corps of Engineers and Army Ballistic Missile Agency, this set is filling a powerful place in missile programs of the Army, Navy, Air Force and Marine Corps. Other GM Diesel engine and generator sets are in service on the DEW Line, in naval transports, personnel craft and many other types of equipment. Models of varying capacities in 50-, 60- and 400-cycle AC as well as DC are available. Want more information? Call our Washington office or write direct.

IMPORTANT FEATURES

Engine and parts interchangeability permits standardization with other GM Diesels used in trucks, cranes, compressors, LOX plants and other equipment. Lightweight for maximum mobility—easily mounted on Army-type 2- or 4-wheel trailers. Trouble-free operation—long life between overhauls.



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Koppers Piston Ring dependability, in even the most rugged applications, is backed with 38 years of experience in manufacturing rings of predictable performance.

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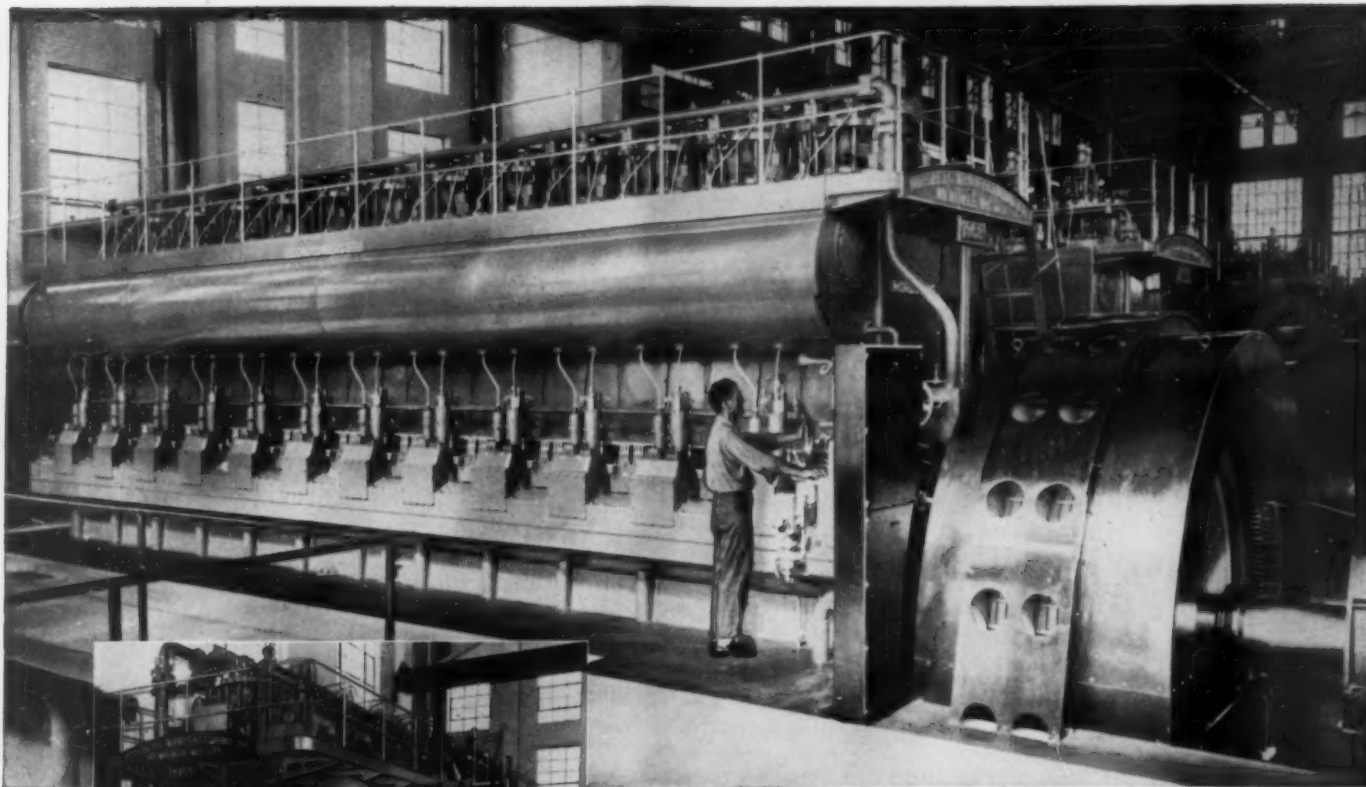
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AMERICAN HAMMERED® INDUSTRIAL PISTON RINGS

Engineered Products Sold with Service

Why taxpayers vote YES ☒ for money-saving diesel power



In Ponca City, Oklahoma . . .

9 NORDBERG ENGINES help make a net profit of almost \$1,000,000 a year

The world's largest dual fuel engine is helping the Ponca City, Oklahoma municipal power plant attain new records in production volume, operating economy, and net profits. This 8,500 horsepower Nordberg Duafuel® unit (shown at left), together with eight other Nordberg engines in this notable plant, produced a total of over 55 million kilowatt-hours in the fiscal year ended June 30, 1958, at a total production cost of just 5.67 mills per kwh. *Net profit for the year was over \$920,000.00, and net plant profit for 10 years exceeded \$7,000,000.00.*

Ponca City and its Light Department owe much to experienced Superintendent of Utilities Pat Schlesinger, who not only directs operations but engineered the big installation. This highly successful municipal plant is a joint achievement, with credit due to Mr. Schlesinger's able staff and to the many present and past city officials who cooperated in the development of this efficient and profitable municipal utility . . . an outstanding example for other municipalities to follow.

POWER PLANT PROGRESS

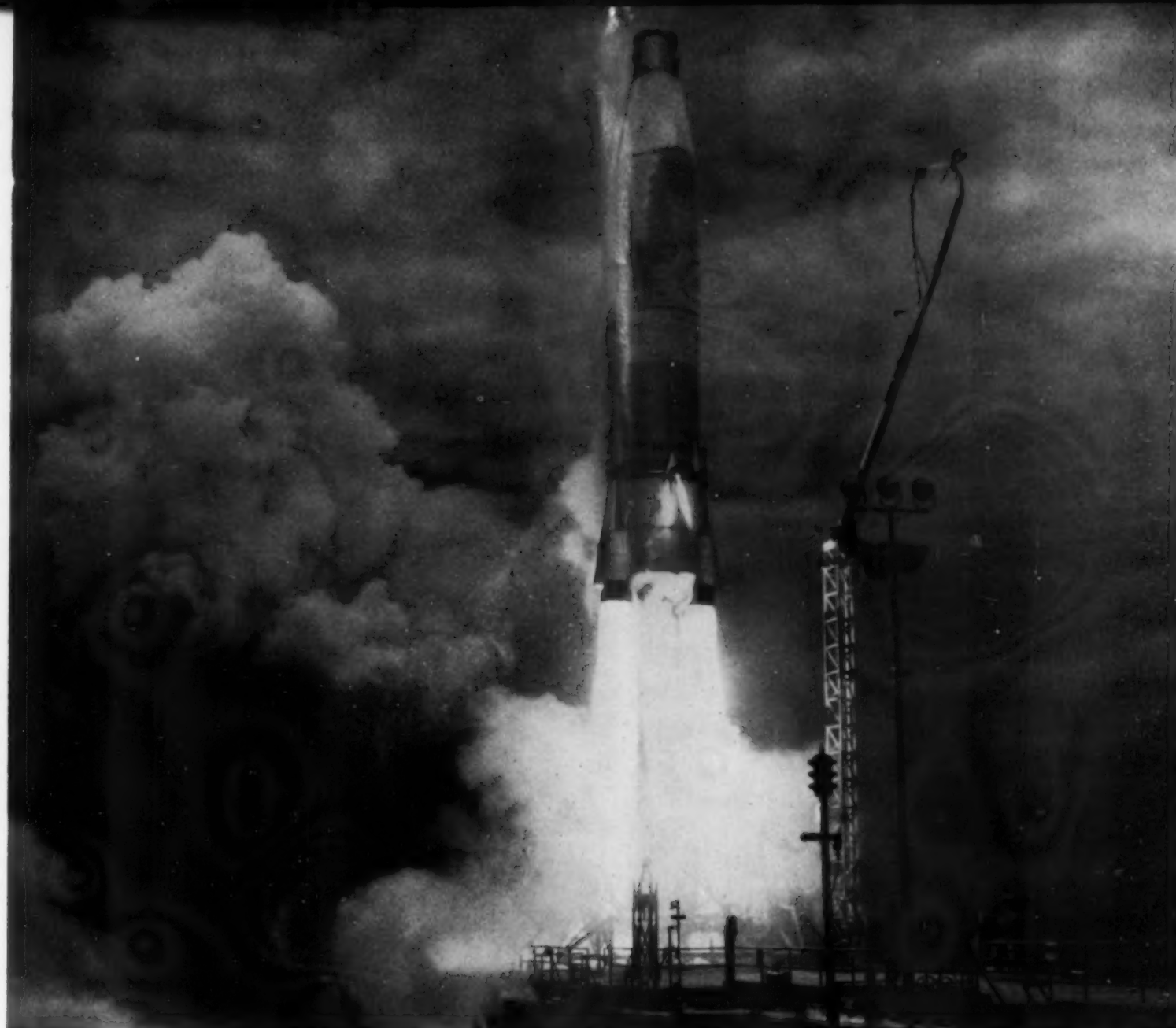
- 1924—First 1250 hp Nordberg Diesel installed at Ponca City.
- 1926—Second 1250 hp Nordberg Diesel installed at Ponca City.
- 1928—Two more 1250 hp Nordberg Diesels installed.
- 1937—2250 hp Nordberg Diesel started (converted to dual fuel in 1947).
- 1947—2400 hp Nordberg Duafuel engine installed.
- 1949—3600 hp Nordberg Duafuel unit added, one 1250 hp unit retired.
- 1952—4275 hp Nordberg Duafuel engine went into service.
- 1953—5135 hp Nordberg Duafuel installed.
- 1955—Ponca City's latest addition—10-cylinder, 29" bore x 40" stroke Nordberg Duafuel engine, rated 8500 horsepower.

©1959, N. M. CO.



NORDBERG MANUFACTURING COMPANY • Milwaukee 1, Wisconsin

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY • MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS
SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • JOHANNESBURG • LONDON • MEXICO, D. F.



OUR DEFENSE DEPENDS ON DIESELS

NOW that our Missile program has progressed to the point where actual site installations are being made and our Early Warning Systems are in advanced stages of development, the essential role being played by prime power producing diesels for our entire defense system comes sharply into focus.

The DIESEL ENGINE MANUFACTURERS of our country are supplying the dependable power to support all missile installations and defense warning and control systems. The diesel engine has been chosen for this key role because it is the only prime mover with the proven ability to provide the most reliable and efficient power right at the location of the power need—guaranteeing a constant source of electricity in time of emergency, while at the same time producing this energy at the lowest cost.

Not a single missile or warning system could function without its diesel-generator unit. The Engine Manu-

facturers of this country have risen to the task of providing power tailored to the specific and rigid requirements of the computers, control systems and other electronic components of the defense network—precise power delivered at all times and under all conditions.

In this magazine, your editors have published a number of articles in the recent past on the varied role diesels are playing in our nation's defense. In this issue, we present detailed stories on the key use of diesels in the Atlas and Mace missile programs.

In future issues, we will fully describe, as articles are approved, the continuing role of diesels in the other essential parts of our defense network such as the Titan missile, Nike-Zeus anti-missile missile, warning and communications systems development, and others.

Rex W. Wadman, *Editor & Publisher*

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Nantucket Express Lines, Inc.
Hyannis, Mass.

New C-300 Oil Keeps 4 Marine Diesels "Remarkably Clean"

Nantucket Express Lines operate the diesel powered "Tek-Fleet" which consists of a former millionaire's yacht and a former air-sea rescue vessel. The yacht, now called the "Catherine-Tek," is powered by two Superior 320 h.p. 8-cylinder diesels while the "Kateri-Tek" has two Superior 240 h.p. diesels of 6-cylinders each. The two boats operate during the summer season carrying about 20,000 passengers to the islands off New England.

Mr. Joseph T. Gelinas, President of Nantucket Express says, "Our season is only four months a year, so we have to be assured that the diesels are in top-notch shape. We

certainly couldn't afford a break-down during our busy season. For this reason, we selected Cities Service C-300 oil which, in our opinion, is the best diesel lubricant available today."

Inspection of the four diesel engines revealed that C-300 dispersant-detergent action has kept them "remarkably clean." During the past four years, there has never been a case of stuck rings. Maintenance records show that filters last longer with C-300 and oil consumption has definitely dropped.

Whether your diesels are marine or stationary or portable . . . you'll find an ideal C-Series oil that is designed to fit your engine and operating conditions.

For full information on the C-Series diesel lubricants, call your nearest Cities Service office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, New York.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

The *Kateri-Tek* docks at Martha's Vineyard with a full capacity crowd. Over 20,000 passengers per season travel the "Tek-Fleet" to the islands off the coast of New England.



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ENGINEER'S FIELD REPORT

CHEVRON PRESSURE PRIMER SYSTEM
JONES-TOMKINS CO.
 Cougar, Washington

Special cartridge fires giant diesel in seconds



At world's highest earth-filled dam construction site near Woodland, Washington, three giant diesel shovels get immediate starts from Chevron Pressure Primer System, reports Jones-Tomkins, general contractors. System helps speed shovel's fill-borrowing operations for this \$51,000,000 project.

Five-year-old 4500 Manitowoc Speed Crane (above), powered by Caterpillar 350 h.p. V-12 D397 engine, operates 18 hours a day, six days a week, loading 21-yard dump trucks in just 70 seconds. Jones-Tomkins uses Standard fuels and lubricants exclusively on this job.

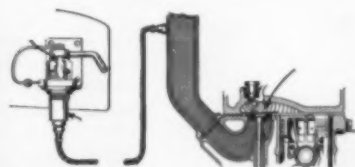


Chevron Pressure Primer Discharger mounted on instrument panel (left) operates satisfactorily despite heavy vibration, reports shovel foreman Henry Watson (right). "We've had absolutely no trouble with this system. The Chevron Pressure Primer System eliminates dust clogging and allows fluid to reach the cylinders quickly. It's the practical way we've found to get these rigs going."



STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20
 THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

Why Chevron Pressure Primer System assures fast starts



- Volatile Chevron Priming Fuel atomizes in induction system at all temperatures even at -65°F, no hand-pumping required.
- Pressure or weakest spark from engine fires mixture.
- Simple rugged air-tight discharger prevents Priming Fuel leakage.
- Small, fireproof, pressurized steel cartridges protect Priming Fuel from water and dirt.

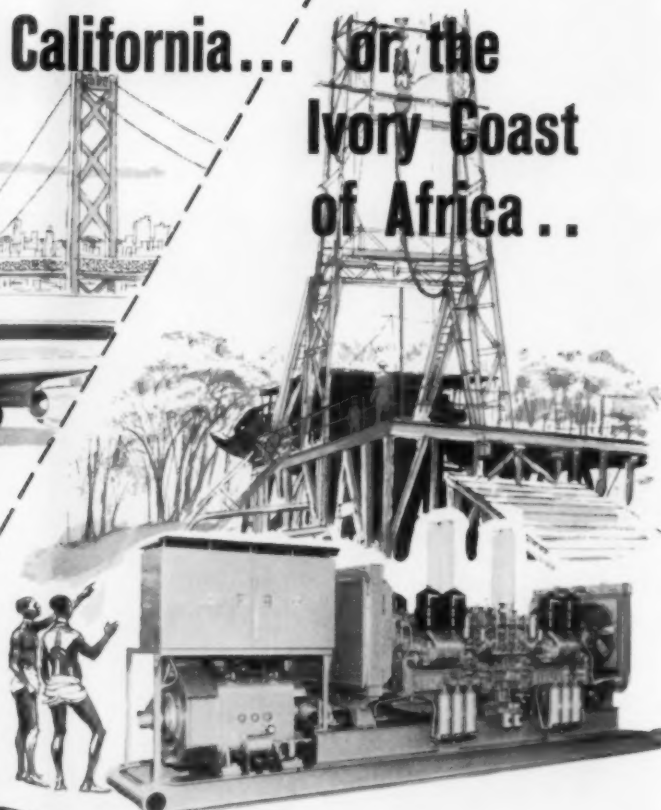
For More Information or the name of your nearest distributor, write or call any of the companies listed.

STANDARD OIL COMPANY OF TEXAS, El Paso
 THE CALIFORNIA COMPANY, Denver 1, Colorado

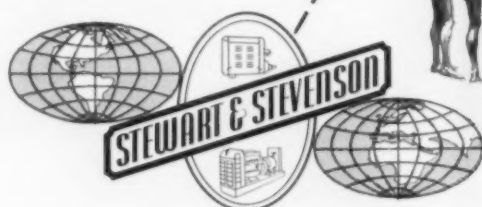
In San Francisco, California... or the Ivory Coast of Africa..



Stewart & Stevenson Self-Propelled, diesel powered, Airport Utility Unit providing electric power for a giant Boeing 707 Jet Liner.



Stewart & Stevenson RIGELECTRIC engine electric power unit supplying power for drilling operations on Laughlin Porter's oil drilling rig in Africa.



When it comes to diesel or gas engine power, Stewart & Stevenson experience and "know-how" have no boundaries.

Here again are two diesel engine power applications . . . in direct contrast and in opposite parts of the world . . . with one important characteristic in common: both were designed and built by Stewart & Stevenson Services, the world's largest distributor of diesel engines. Both power applications are serving vital industries where thousands of dollars and valuable contracts are totally dependent on the reliability and performance of this engine driven equipment.

When you need power . . . for any application in any part of the world . . . Stewart & Stevenson's experience, service organization and engineering will guarantee dependable performance. We will be glad to study your power needs and submit recommendations. Please write for additional information.



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THE WORLD'S LARGEST DISTRIBUTOR OF DIESEL ENGINES

Sludge in engine ends with switch to STANODIESEL Oil M

The team that got the engine back in shape; (l. to r.) Vernon Schwertel, Ronald Darbo and Standard's Fred Parkinson. Providing lubrication technical service on problems like this one is not new to Fred Parkinson. He's been doing it for 11 years. He has further qualification for such work—an engineering degree from Brown University. Fred has also completed the Standard Oil Sales Engineering School.

Situation: For five years a 1,400 hp. engine in the Municipal Light Plant, Arcadia, Wisconsin, was operated on STANODIESEL Oil M. During this time the engine ran free and clean. It carried a major share of the plant's 20,000 kw. output. A decision was made to switch the engine to another lubricant since it was believed one oil was as good as another.

What happened: Within two years the engine had sludged up so much, the oil had to be removed and replaced by STANODIESEL Oil M. Three months later the engine had cleaned up and was again carrying its share of the plant's load.

Clean engine operation is possible with STANODIESEL Oil M because of its superior base stock and its combination of additives that are available in no other oil. Superior base stock and exclusive additives give you these cost-saving operating and maintenance advantages: less sludging, low oil consumption, reduced port deposits, fewer stuck rings, less need for ring replacements, less cylinder wear, lower filtration costs, fewer bearing problems.

Get more facts about STANODIESEL Oil M. Call the Standard Oil office near you in any of the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**



You expect more from **STANDARD** and you get it!

Quick facts about STANODIESEL Oil M

- Keeps crankcase, pistons, cylinder walls clean.
- Combats deposit and wear problems imposed by economy fuels.
- Maintains film on difficult-to-lubricate parts.
- Eliminates fuel injector and pump sticking caused by deposits on injector barrel and plunger where fuel and lube oil mix.

Honor Cat Advertising

Caterpillar Tractor Co. has been named to receive one of the *Saturday Review's* Eighth Annual Awards for distinguished advertising in the public interest. Twenty-four other companies were included in the group to receive the awards. Caterpillar was the only heavy equipment manufacturer to be honored. Caterpillar's award was made for the Company's advertising in the public service and public relations fields; a continuing campaign outlining national goals which must be achieved by 1975 if the United States is to maintain its standard of living and world leadership. The national goals campaign was launched in January of 1959 with the advertisement "A Little Statistic—and the nation's big challenge." In October, a new-born infant, "Robert," was chosen as the symbol of the urgency of attaining the goals. Monthly advertisements, with the growing "Robert" prominently featured, show what is being done by individuals, groups and industries toward fulfilling the needs by 1975. The Caterpillar campaign received the second largest number of votes from the 25 editors, educators and advertising executives. First place in the balloting went to Container Corporation of America. N. W. Ayer & Son, Inc., is the agency for Caterpillar's general magazine advertising.

GM Distributor Appointed

Abbott-Glass GM Diesel, Inc., of Salt Lake City, Utah, has been appointed distributor for GM Diesel engines manufactured by the Detroit Diesel Engine Division of General Motors. The newly established company will handle GM Diesel sales, service and parts in the State of Utah and in several bordering counties in Nevada, Oregon, Idaho, and Wyoming. A branch has also been established at 900 E. Park Blvd. in Boise, Idaho. Heading the company is R. G. Abbott, president, and E. W. Glass, Jr., vice president. D. D. Mentzer is service manager. F. E. Hamilton heads the parts department. Abbott was formerly a GM Diesel zone service manager, and Glass had been engine shop foreman for Morrison-Knudsen of Boise. Glass will head the new company's Boise branch.

Waste Heat Boiler Bulletin

A new line of waste heat boilers is described in Bulletin 1700 just released by the International Boiler Works Co. It contains engineering drawings and specifications on this specialized line of International-LaMont forced recirculation generators designed to make maximum use of waste heat from industrial and process heat sources. These generators incorporate the basic LaMont principles of high velocity circulation through small diameter tubes with a patented

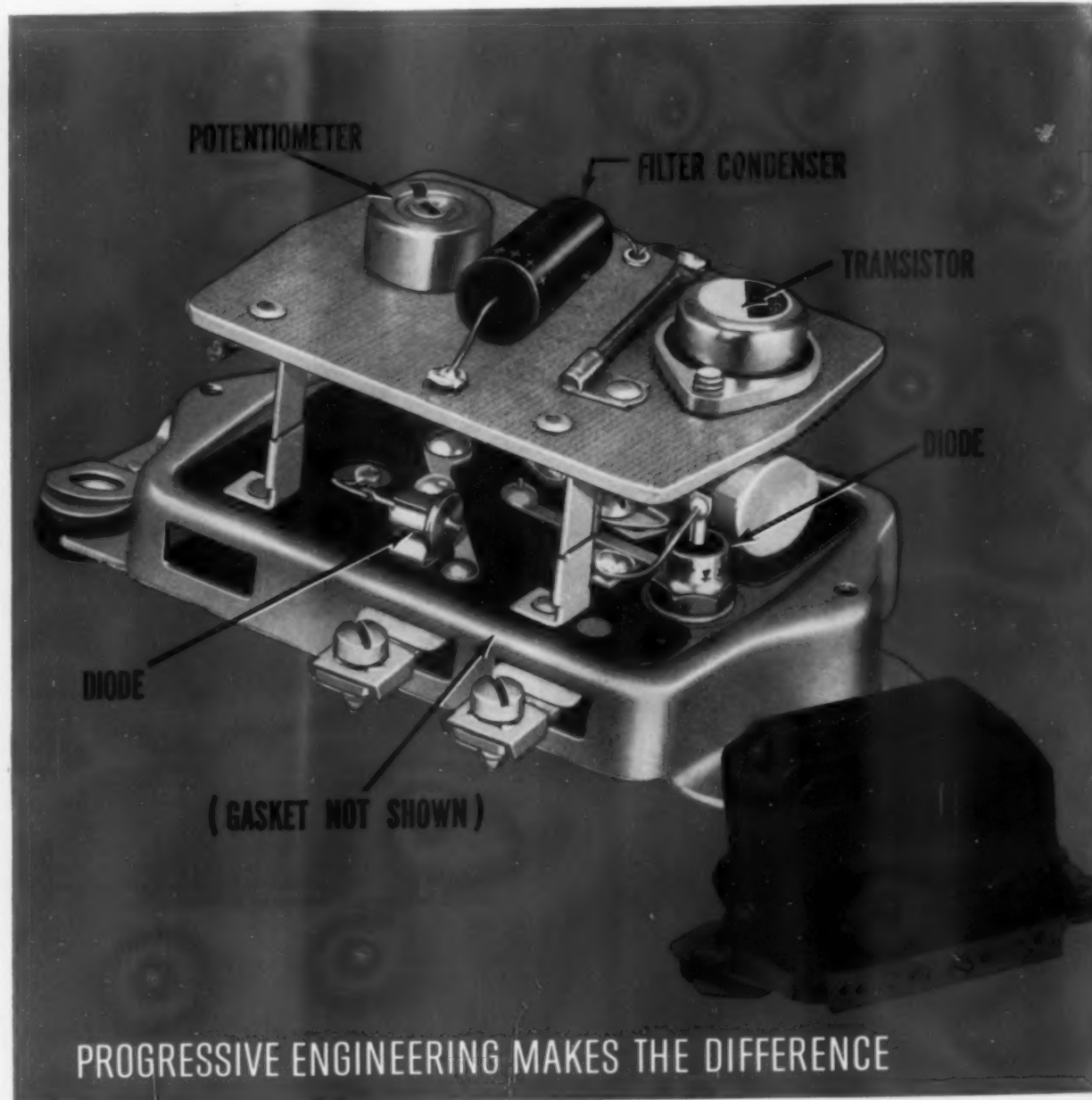
orificing method to assure uniform flow distribution. High heat absorption rates and output capacities are assured with greatly reduced waste heat boiler space requirements. Requests for the bulletin and inquiries on specific waste heat applications are invited. Inquiries should be sent to the International Boiler Works Co., 119 Oak St., East Stroudsburg, Penn.

(ITS NEW)

Firm Buys 27 Tractors

As part of a fleet expansion and modernization program, Leased Trucks, Inc., has added 27 International diesel highway tractors to its 128-truck fleet. The firm operates nationwide, delivering fresh hanging beef and pork carcasses, dairy products, cookies, fruit, vegetables and other grocery items. Twenty-four of

the new trucks are International model DCOF-405 tandem-axle tractors with 80-inch sleeper cabs. These 148½ inch wheelbase models are equipped with 195 horsepower Cummins engines. The three remaining trucks are compact-design International model BC-225-DL tractors featuring lightweight construction. They are also equipped with 195-horsepower engines, and have 158-inch wheelbases.



ONLY DELCO-REMY OFFERS FULL-TRANSISTOR

***Designed for use with
DELCO-REMY'S new self-
rectifying a.c. generators***

Now you can choose between *two* modern new Delco-Remy regulators—the most accurate available today. One is a full-transistor model, the other transistorized.

The **FULL-TRANSISTOR REGULATOR** has no moving parts and offers the ultimate in accurate electrical performance, durability and reliability. It is composed entirely of transistors, diodes, condensers and resistors, permitting higher field current for better generator performance. Constant voltage control is unaffected by temperature changes, vibration, or mounting position. A simplified external adjusting feature permits easy voltage setting for varying operating conditions. And this full-transistor regulator requires no periodic servicing.

The **TRANSISTORIZED REGULATOR** contains a single transistor and diode working in conjunction with a vibrating-type voltage sensing unit. The transistorized circuit

DIESEL AND GAS ENGINE PROGRESS

New White Branch

White Truck Division of the White Motor Company formally opened its new Cincinnati branch headquarters, at Spring Grove and Station Avenues, May 12. The new branch, based on a layout and equipment plan introduced by White the past year in new branches at Denver and Louisville, highlights ex-

tensive parts stock for all makes of trucks, efficient drive-through service area, and fully-equipped machine shop with dynamometer, Norman G. Schacht, branch manager, announced. Replacing White's former Cincinnati headquarters at 2230 Gilbert Avenue, the new facility will serve truck users throughout the Cincinnati area as factory branch for sales, parts, and service.

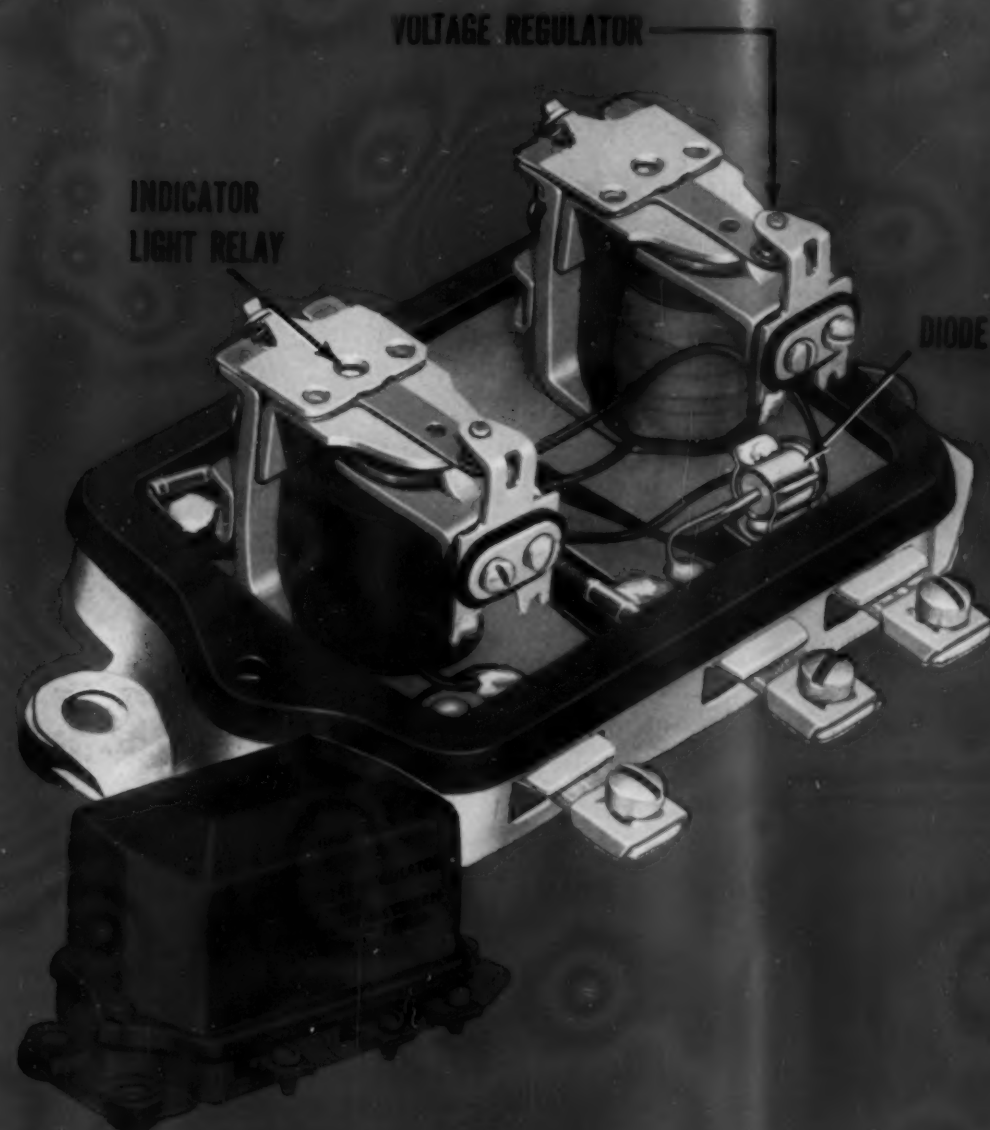
Tank Truck Brochure

A new, 6-page fold-out brochure entitled *Series 53 and 71 Engines For Profitable Tank Truck Hauling* is now available from the Detroit Diesel Engine Division of General Motors Corp. In addition to illustrations and dimensions of Detroit Diesel's 6V-53, 6V-71, and 8V-71 engines, the new brochure gives

complete horsepower data on the Division's 97 to 290 HP automotive engines covering in-line and Vee models. Copies may be obtained by writing Detroit Diesel, Detroit 28, Mich. **(ITS NEW)**

Water Pollution Report

Towns and cities are fighting a losing battle in trying to meet water pollution problems. This is apparent in a special report filed by the Public Health Service with the Senate Select Committee on National Water Resources. The report urges that highest priority be given scientific research and other actions for dealing with the increasing volume, strength and chemical complexity of sewage and industrial waste now threatening to curtail clean water supplies. To meet the problem will require new treatment processes, probably based on entirely new concepts and principles, that will achieve what approaches the conversion of waste waters to fresh water, the report stated. This, it added, will require "a major coordinated research program which must utilize the best minds in the country and be able to attract physicists, physical chemists, hydrologists, economists and devotees to other disciplines whose skills have not, up to now, been fully utilized in pollution research." The report says pollution problem is being complicated further by the growth of great cities, some crossing state lines, which are bringing sewer outlets closer to water intakes, increasing the volume and strength of sewage, and presenting situations that are already taxing the administrative and financial resources of public agencies. It points to indications that water requirements 20 years hence will approximate the total supply that can be made available from presently-known sources. Many areas will have to drink water that has previously been reused over and over again, intensifying the problem of preserving its purity. In urging that action to protect water supplies be given highest priority, the report listed steps, in addition to scientific research, as follows: Planning up to \$8 million per year of water quality control programs for river basins. Collection of data on the sources, strength, volume and hazards of pollution, including adequate information of new types now being encountered. Construction of the \$4.6-billion unbuilt backlog of remedial works needed to employ the best methods now available to clean up water sources in the next five years. Better enforcement of State and Federal anti-pollution laws. Legislation to meet new pollution problems, such as to permit joint action where sprawling urban areas cross state boundaries. And, action to establish wider public understanding of the pollution problem and place public support behind action for its correction.



AND TRANSISTORIZED VOLTAGE REGULATORS

permits high field current for improved generator performance with low non-inductive current through the contacts for greatly extended contact life. Models are available for circuits containing either ammeters or indicator lights. All units are temperature compensated to better match battery voltage requirements.

Both the full-transistor and the transistorized models have the same mounting dimensions as standard regulators.

Whichever model you choose for your new vehicles or for replacement on present ones, you can be sure of reduced servicing and extended battery life. Available from your car or truck dealer or through the United Motors System.

FROM THE HIGHWAY TO THE STARS

Delco-Remy
ELECTRICAL SYSTEMS



DELCO-REMY • DIVISION OF GENERAL MOTORS • ANDERSON, INDIANA



American Pipe and Construction Co., operating throughout the West from headquarters near Los Angeles, offers a wide range of reinforced concrete pipe for virtually every water supply, sewerage and drainage pipeline requirement. The company chose Fuller 5-C-720 Transmissions for heavy hauling because of their work-matched gear ratios, low gear-tooth pressures, helical gearing in all forward speeds, short length and light weight.

Geared by Fuller . . .

More profit from JOB-SPECIFIED Transmissions

Whatever you're moving — concrete pipe or cotton, radishes or rock — there's a Fuller Transmission to help you do the job faster, easier and more profitably. Fuller offers:

- 88 models of heavy-duty transmis-

sions for trucks, construction equipment and industrial use.

- Capacities matching gasoline, diesel and LPG engines . . . from 330 to 1550 cubic inches . . . up to 600 hp.

- Models available with manual and

semi-automatic shifting, or with the new, all-air-actuated Fullair Control.

Your job writes the specifications for the Fuller Transmission engineered to boost *your* profits. Get full details from your dealer.

FULLER

TRANSMISSION DIVISION
MANUFACTURING COMPANY
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Automotive Products Company, Ltd., Automotive House, Great Portland Street, London W.1, England, European Representative

LONG HAUL MOVER DIESELIZES TO MAINTAIN AVERAGE ROAD SPEED

**Lyons Van Lines Solves Problem of Increasing
Road Congestion and Rising Operating Costs**

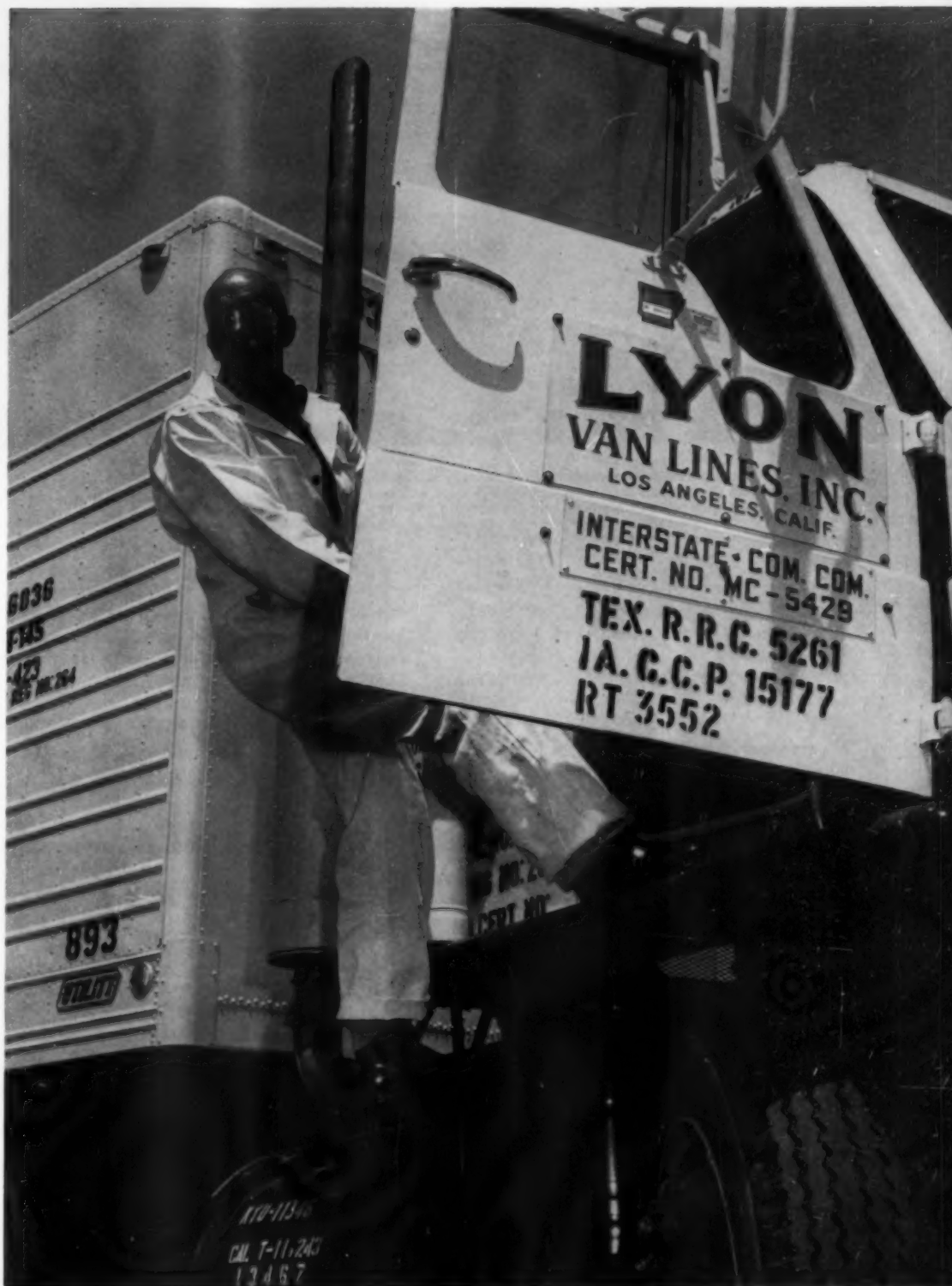
By JAMES JOSEPH

TO the Los Angeles desk of Charles G. Long, vice president and general manager of Lyon Van Lines, Inc., recently came a plaintive letter, its postmark Boston, its handwriting plainly feminine: "... newly arrived from the west coast and friendless, my husband, the children and I drove up to the house we'd rented sight unseen here in Boston ... and there, waiting for us with our furniture, was an 'old friend' from California ... your van driver. Never was a familiar face more welcome."

Lyon's long line van drivers? Like long-haul movers coast-to-coast, they're America's "family men"—guys whose roadable business is displaced households and their householders. "Ours is a kind of road-legal race against time," concedes Long. "You can't leave one of 'your' families stranded without furniture." The "race"—which often sees a van man solo LA-New York in a week's time—is increasingly being pegged to dieselization.

Only seven of Lyon's 100-tractor fleet were dieselized a year ago. Today, nearly half of them—42 to be exact—carry 180-220 hp diesel engines beneath their cabs (most are COE sleepers). In March, Lyon announced that in its big switch to diesels there was invested some \$400,000 for a spanking new fleet of 25 International DCO-405 COEs, with Cummins NH-220, NH-195 and NH-180 diesel engines. Lyon's Long, terming the switch "significant in long-haul van operations", put his finger on two major reasons why: 1. The urgent need of long haul movers to hold or, if possible, to better average road speeds in the face of heavier loads (thanks to 35-ft. hi-cube semi-trailers). The problem: increasing road congestion, especially in the East, which chops a driving day's mileage-average fully 25% compared to the western-road pace. 2. Steadily rising operational costs which, increasingly, favor the diesel's heftier power. A careful Lyon fleet survey shows that diesels (especially 180 hp and up) manage nearly twice the mileage per gallon, require 25% fewer dollars to maintain. "Faced with heavier loads, traffic congestion and hemmed by a legal ceiling on over-the-road rig speed, we're betting on power to keep up our road speed average," confirms Long.

Lyon loads have increased significantly in the past few years, due to cab-over tractors which permit the line to run 35-ft. hi-cube trailers (2450 cu. ft.) rather than 30-footers of a decade ago (capacity 1680 cu. ft.) or 32-ft. hi-cubes, (developed about





Warren Fisher, superintendent of operations for Lyons Van Lines discusses one of the firm's new International DCO-405's with a mechanic. The new International units are equipped with Cummins engines (NH-220, NH-195 and NH-180), Fuller RoadRanger transmissions, Vortex air cleaners, Delco-Remy starters and generators.



five years ago), their capacity 2080 cu. ft. The load-room gain in the past dozen years: a hefty 770 cu. ft., or about 30 percent. Coupled with this gain has been Lyon's step-up in haul mileage—more than 8,000,000 miles last year. Lyon expects to rack up an even higher total for 1960.

Road congestion looms as a kind of operational barrier. With rig speed legalized to but 45 mph on some two-lane roads, but 50 mph on many multi-lane highways, a mile-per-hour lost is an mph seldom regained. Van drivers, who sometimes manage 400-500 miles in a 10-hr. driving day across uncongested western stretches, see their mileage

whittled to 275-300 miles/day in the East. Says one driver, "from Illinois east, you run into traffic and trouble." LTL haulage also prescribes an upsurge in power. Why? Because many long-haul trailers head east with LTL consignments to be dropped off at as many as ten way-points. Drop-offs are time-consuming. Thus the need for maximum road speed on these operations.

To maximize it, Lyon and its fellow long-haul movers are turning increasingly power-minded. Putting more horses under the cab permits rigs to take even the steepest western grades one or two gears higher rather than in slower, lower gears.

"A few mph picked up on the up-grades can mean the difference between 400 miles a day or 375 miles/day," says Long. Modest tho the mileage increase may seem, it can cut half a day from a coast-to-coast run, assure a family its furniture when it needs it. The alternative: strand a family without beds or bassinets.

Nor are long-haul movers oblivious to the fact that airfreighters, with a judicious eye on corporate and plain citizen wanderlust, are making a bid for household moving. Only recently, at the 3rd Western Materials Handling Show in Los Angeles, a cargo specialist for American Airlines said AA was shopping for all-cargo jetliners, its intention to "put wings on household furnishings." Urgently, then, grows the long-haul mover's need to hold and even increase average road speed. Heftier power, too, racks up some human gains: less fatigue for drivers. And on long solo hauls that's important. The tractor that can pull its load upgrade in close to the highest of its 10 forward speeds (the 10-speed transmission is van common), may reduce by 25% the amount of shifting a driver must do. Says general manager Long, "Shifting . . . more of it than absolutely necessary . . . contributes nothing to a long run except driver fatigue." But Lyon's big switch to dieselization is even more motivated by fleet statistics which equate fuel and maintenance costs for every Lyon rig and for every mile.

The operating cost table shows how 1959 shaped up, diesel-versus-gasoline power, for what Lyon

Tractor No.	Kind of Engine	Total Miles Driven-1959	Miles per Gallon	Fuel Cost per Mile (cents)	Maintenance & Repair Costs per Mile (cents)
#822	Gasoline, 450 cu. in. dis./6 cyl	32,816	3.42	8.85	5.87
#824	Gasoline, 450 cu. in. dis./6 cyl	56,568	3.84	8.22	4.30
#882*	Gasoline, 450 cu. in. dis./6 cyl	58,428	3.63	8.61	7.48
#1170	Gasoline, 461 cu. in. dis./8 cyl	62,925	3.66	8.39	3.12
#812*	Diesel, 672 cu. in.	59,149	6.37	3.92	4.3
#814*	Diesel, 672 cu. in.	64,519	5.87	4.1	4.2
#1100	Diesel, 672 cu. in.	55,621	5.7	4.46	4.1
#1102	Diesel, 672 cu. in.	55,782	5.6	4.49	2.4

*had major engine overhaul



With tractor cab tilted, easy access is provided to NH-220 engine. Nugent full flow lube oil filters and Fram fuel oil filters are used on Lyon's new Internationals.

categorizes as "typical" rigs. The diesel rigs' fuel costs per mile were, on the average, 48-50 percent less than for gasoline-engined tractors. On the average, diesels managed 5.88 mpg, compared to an average 3.64 mpg for the gasoline tractors. Maintenance and repair costs averaged 5.14 cents per mile for the gasoline, but 3.75 cents for the diesel. And, significantly, two of the four diesel rigs pegged as "typical" had undergone a major engine overhaul, compared to one gas-engined "major". Despite those "majors", diesel per-mile maintenance/repair costs ran far below that for Lyon's typical gasoline engined tractors.

Another factor in Lyon's switch to dieselization is what you might call the diesel's growing "neighborhood acceptance." Lyon's over-the-road tractors, in many cases, roll right up to a householder's front door. "The diesel," affirms Long, "is nowadays accepted . . . in our neighborhoods." Neighborhood accepted are Lyon's spanking new fleet of hydraulic tilt-up International-Harvester (model DCO-405) COEs, Cummins powered. Half the fleet carries Cummins NH-220s, rated 220 hp at 2100 rpm. The engines are 4-cycle, 6-cylindere, have a bore of 5 1/4 ins., a stroke of 6 ins. and 743 cu. in. displacement. All 25 new tractors have either Fuller R-960 RoadRanger 10-speed transmissions or the Fuller R-96 (10th direct), Lipe 14-inch, 2-plate clutches and dual oil filters (main



is by Nugent, the bypass a Luber-finer). The engines are naturally aspirated thru Vortex air filters. Fuel oil is Fram-filtered. Timkin rear axles have ratios of from 4.1 to 4.6 to 1.

Lyon maintains its own extensive shops in Los Angeles (16 men alone are assigned preventive maintenance), has terminals in San Diego, San Francisco, Seattle, Indianapolis, Dallas, Salt Lake City and more than 500 world-wide agents. Counting in-town pickup as well as long-line operation, it employs some 225 drivers, 180 of them over-the-road van men. Says shop foreman Roy Custis, "in the Los Angeles shops we turn a rig around—ready for a cross-country haul." Facilities run the gamut from wash-steam racks to tire shops.

Lyon hews to the preventive maintenance system inaugurated by the California Trucking Association, Inc. Each rig carries a "tear-out" mileage book. Every 50 miles drivers "tear out" a stub. By the time they've racked up 2000 miles, a special "2000 Mile" check chart is exposed. The check made, they keep tearing mileage stubs until a pink "6000 mile" check page comes up . . . and, eventually, a "blue" 12,000 mile maintenance outline. Tho more routine 2000-mile checks are often performed at major truck stops, 6000 and 12,000-mile majors are usually scheduled into Lyon's Los Angeles shops. "But wherever the rig," says fleet operations supervisor F. Warren Fisher, "every increment of fuel, maintenance labor and mileage is carefully kept—and flows to our statistical clerk in Los Angeles, his full-time job a breakdown of

Here Charles G. Long, Lyon vice president and general manager, discusses the increased economy received from the new diesel tractors with driver Edward T. Cannon and International's Los Angeles branch manager, Elmer T. Kendrick.

costs, big or small. He keeps a running biography of every Lyon rig."

What of the long-haul driver, the Lyon's "family man?" He combines over-the-road ruggedness with a canny aptitude for public relations. And, as oftentimes Lyon's only face-to-face contact with the moving public, he's got to know how to calm the harried housewife, pack her goods, gentle her most cherished possessions. That done, he hits the road—often a solo run across country. A day away from his destination, he wires ahead, gives the householder his estimated time of arrival. When he pulls into town, he usually pulls, too, into a modern truck stop where he showers, shaves, changes into his "meet the public" uniform (white coveralls with Lyon's insignia in blue) . . . and as importantly, runs his road-dusty rig thru a washer. The aim: to roll clean shaven and clean rigged to the householder's door . . . as spick-and-span as when, maybe a week before, he waved goodbye and headed across country in that road-legal race against time.

Rolling curbside to a householder's very door, a Lyon driver finds himself more than a guy behind the wheel, and more, too, than a mover of household furnishings. Often, as the lady newly arrived in Boston wrote, he's an "old friend" . . . and for America's displaced families, never was a friend more welcome.

8000 HP DIESEL PLANT FOR LAUNCHING ATLAS MISSILES

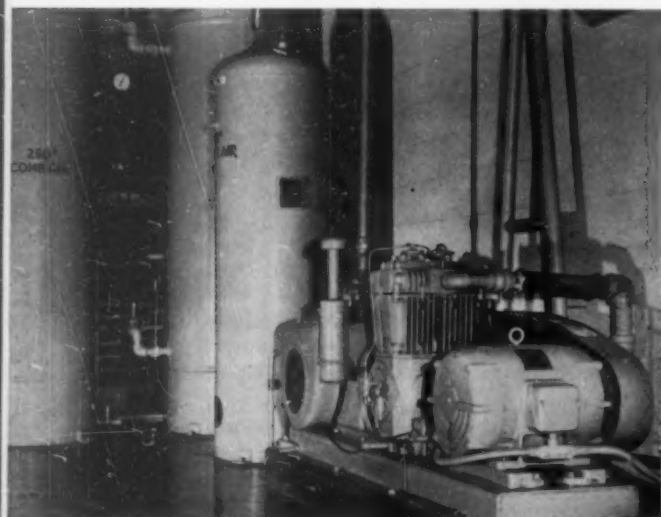
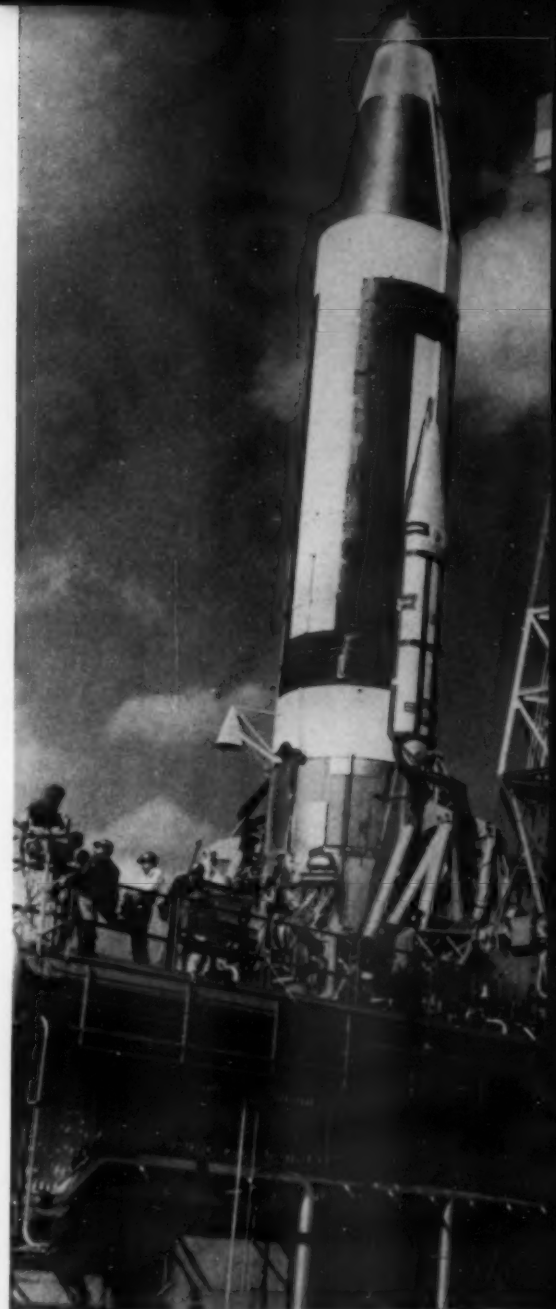
Six Nordberg Turbocharged Engine-Generator Sets, Installed to Operate on Heavy or Light Fuel, Provide Sole Power Source for Atlas Complex at Vandenberg Air Force Base

AT Cape Canaveral, military planners learned that an independent source of power was the one way to guarantee sufficient and stable current to launch, guide and track missiles. This lesson was fully applied when Vandenberg Air Force Base in California began to develop as a space age defense site from which to launch the gigantic Atlas guided missiles. The major mission of Vandenberg is to maintain an operational status with ICBM's. The base must be ready at a moment's notice to blast off its "birds" without fail. Vandenberg also serves as a training site for SAC ICBM crews to be deployed at bases throughout the country. There-

Editor's Note: Nordberg Manufacturing Company is currently producing 48 diesel engine-generator sets rated 1450 hp, 1000 kw for installation at Titan missile bases around the country

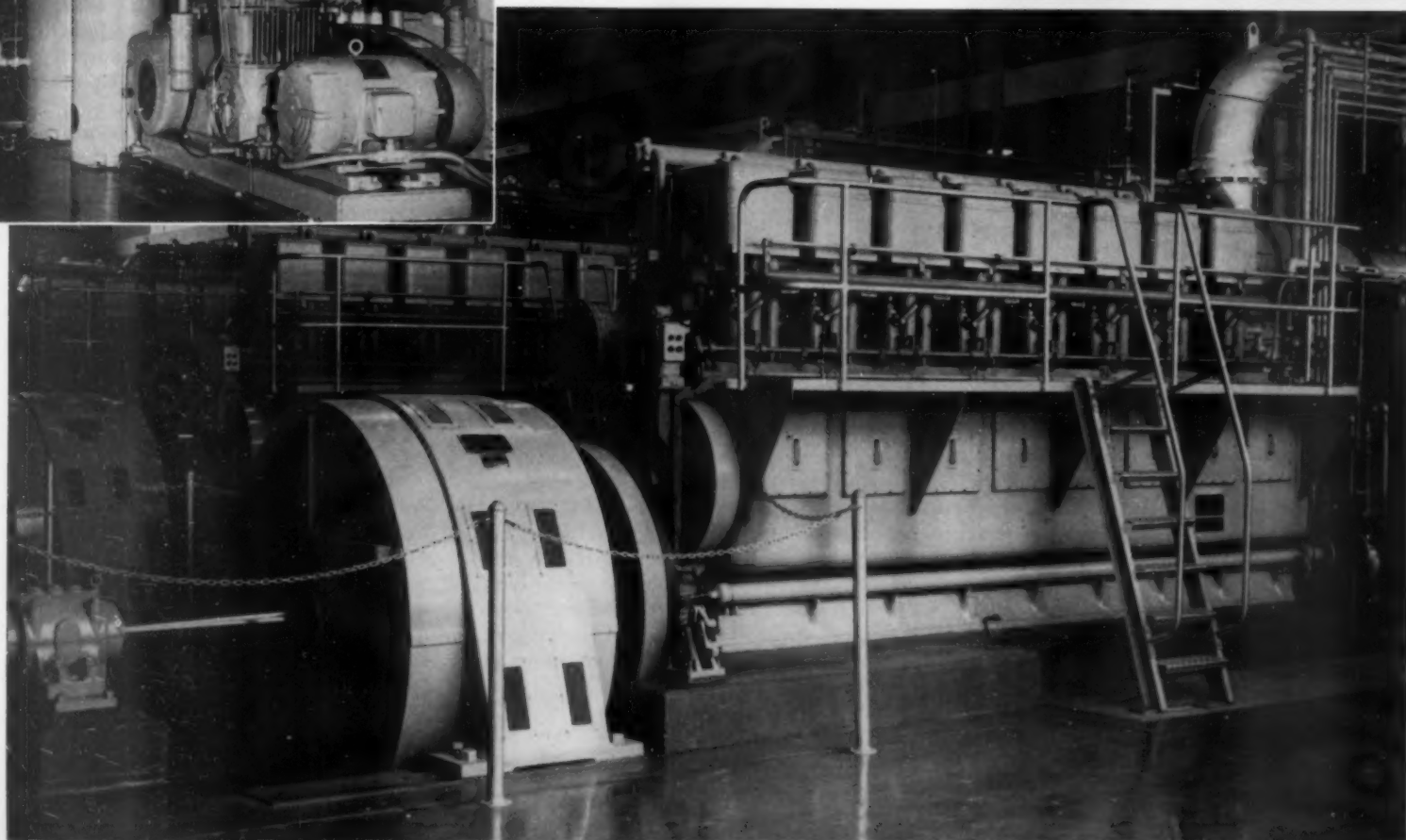
fore, the Atlas complex at Vandenberg includes a modern, spacious 8,000 horsepower Nordberg diesel-electric generating plant.

Locale is an isolated point of land which juts into the Pacific Ocean about 150 miles northwest of Los Angeles. Sprinkled sparsely through this brush-covered area are evidences of the free world's first operating and training base for both intercontinental (ICBM) and intermediate range (IRBM) ballistic missiles. Suddenly, the sandy plateaus and rocky ravines facing the sea have sprouted towering gantries, huge concrete slabs, a busy air field, homes and barracks, shops and offices...and a power plant, partly hidden and protected in a declivity in the earth. Several years ago this wild and remote area was the Army's Camp Cooke, named after a long-forgotten Civil War general.



← A 2-cylinder, single-stage, 250 lb. Quincy air compressor is driven by a 15-hp motor with a standby gasoline engine for emergencies.

Three of six Nordberg engines at Vandenberg Air Force Base. Each engine is rated 1344 hp at 450 rpm at 2000 ft. altitude and turn 956 kw Ideal Electric generators to provide all power for the Atlas ICBM complex. Note Woodward governor and Bendix Scintilla fuel injection pumps. →



Atlas missile 12-A on test stand at the Pacific Missile Range—Vandenberg AFB.

and use a school bus to simplify their costly and time-consuming transportation problem. Not far from the main gate, sage brush was being bulldozed into piles and burned. A sign proclaimed that 6,000 homes will be erected on the site. Just inside the main gate, the government has built more than 1400 attractive but nearly identical little homes. Locally, this development is called "Capehart Village" in recognition of Senator Capehart who sponsored the military housing bill. It is an understatement to say that a strain has been placed on all phases of the economy in this remote rural area, partially surrounded by the sea. Public utilities bear the brunt of the shock wave of people and the new diesel power plant provides ample, independent electric current for uninterrupted operation of the complex and the launching of guided missiles in any emergency.

The Atlas is the free world's first operational ICBM. An Air Force project, work on it has enjoyed top priority. It has logged several intercontinental flights of up to 6300 mi. While this missile undergoes changes and improvements constantly, its length has been between 85 and 90 ft., its weight about 120 tons, and the estimated price tag per missile about two million dollars. An Atlas squadron is divided into teams of specialists, numbering from five to twenty men. There are, for example, launch, periodic maintenance, mobile maintenance, nose cone and guidance teams plus men for logistics, "housekeeping," and office duties. There are six launching pads in various stages of completion in the Atlas complex at Vandenberg. The complex is a restricted area at some distance from other base facilities and does not include living quarters, shops, and other activities to which the public must have easier access.

Six model FS-138-ISC Nordberg diesels were selected to be the sole power source for the complex. The plant went into operation November 3, 1958. By mid-1959, electric current requirements had grown until the demand ranged from 900 to 1600 kw. This required using only two generators at a time, but the load was expected to double by mid-1960. This still will leave the plant with plenty of reserve capacity. The Nordberg engines are oil burning, 4-cycle, 8-cylinder turbocharged diesels rated 1344 hp at a conservative 450 rpm, giving the plant a total capacity of 8,064 hp. Each diesel drives an Ideal Electric 956 kw, 1195 kva, 60 cycle, 3 phase alternator with V-belted, 15 kw exciter. From the day it went into service until July 1, 1959—eight months—the plant produced 4,200,000 kwh. An engine is operated from 36 to 48 hrs., then shut down and another placed on the line.

Either No. 2 or No. 4 deisel fuel can be used. The fuel is stored in a tank farm of 174,000 gals. capaci-

ty. It is pumped by a transfer pump to one or the other of two centrifuges and thence to the day tank. When light fuel is being used, it passes through duplex filters on the engine and then to the injection pumps and nozzles. Heavy fuel goes through industrial-type filters. Intake air which is obtained outside the building via oil-bath filters, goes to the turbochargers through air intake mufflers. From the turbocharger, air goes to the intake header through an intercooler mounted on the engine. Lubricating oil is stored in two underground tanks, each with 1000 gallons capacity. An engine-driven pump picks up oil from a sump in each engine bed plate and forces it to a full-flow filter, to the lube oil cooler, to the lube strainer, to the lube oil header and then to the various engine parts. It drains back into the sump by gravity. Every six weeks a set of lube oil samples is drawn and sent to an Air Force laboratory for analysis.

Cooling water is provided by a cooling tower atop the building. The jacket water heat exchangers, as well as the lube oil coolers, are beneath the floor of the building in what is the equivalent of a partial basement. The water is analyzed weekly. If tests show need for additives, Calgon CS is added to the jacket water, Calgon TG to the cooling tower. A supply of starting air is maintained by a 2-cylinder, single-stage, 250 psi compressor. This unit is driven by a 15 hp motor. In case of an electric failure, an air-cooled gasoline engine can be used to run the compressor. The engines are equipped with the standard alarm and shut-down devices which operate through Nordberg control gauge panels. Emergency lighting in the plant is provided for by a bank of 60 storage batteries.

All other facilities at Vandenberg Air Force Base, including the Thor IRBM complexes, and the Point Arguello Naval Missile Facility are dependent on public utility power. But the vital Atlas

Vandenberg constitutes nearly 70,000 acres on a once desolate coast. The explosive effect of this military boom on a sleepy countryside must be realized in order to grasp the importance and necessity of the Nordberg generating plant. The area of the vast military development has but two small cities. Santa Maria, 18 miles from the Vandenberg main gate, was a farming center of less than 16,000 persons. Already, its size has increased by thousands and it grows each day. One new school building opened with five unused classrooms in the fall. Before spring, all classrooms were overflowing. The increase in enrollment in this school—typical of others in the area—averaged nine pupils a day. Lompoc, eight miles away, had fewer than 6,000 residents, but now there is talk of twenty...thirty...fifty thousand. This once-quiet town is surrounded by farms devoted to growing flower seeds. The only other industry is the mining of diatomaceous earth in the nearby hills where two eastern corporations have big operations.

Many civilian employees of the base commute daily from as far as beautiful Santa Barbara, 75 miles away. One group of 24 Santa Barbarans bought



Outside the Vandenberg plant each of the six Nordberg diesels has an American air filter cycoil oil-bath air filter and Kittel exhaust muffler.

complex has the protection of its own dependable generating plant to assure an unfailing power supply. Besides its primary mission for the Atlas, provision is made for the Nordberg plant to furnish electricity to three other base complexes.

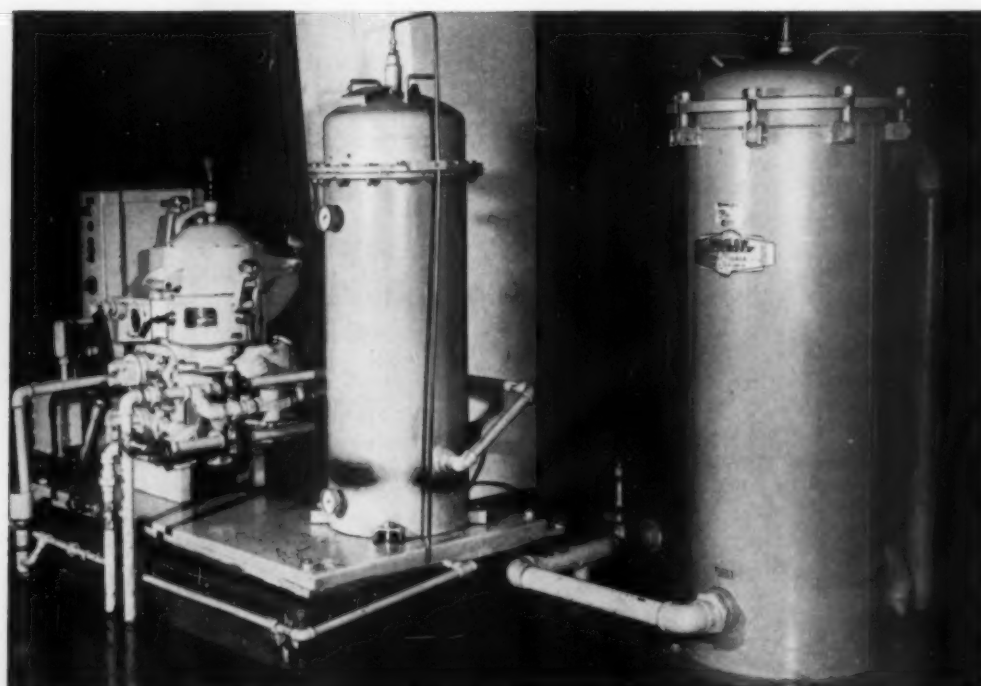
List of Principal Equipment Vandenberg Atlas Complex Power Plant

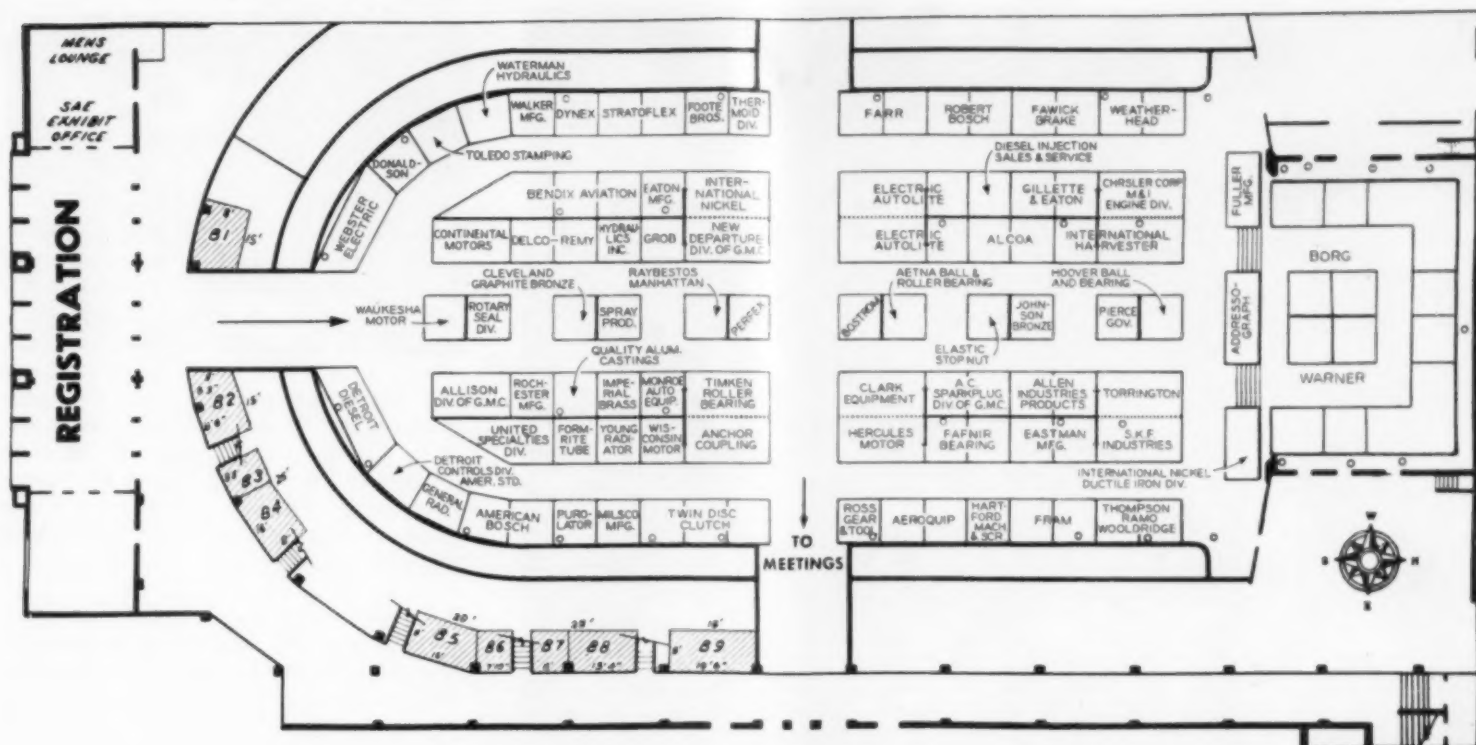
Engines	Nordberg
Alternators & Exciters	Ideal Electric
Turbochargers	Elliott
Governors	Woodward
Control panels	Nordberg
Switching gear	Federal Pacific
Outboard bearings	Dodge
Intercooler	Young
Fuel & lube oil centrifuges	DeLaval Separator
Centrifuge motors	Louis Allis
Fuel & lube oil filters	Fram
Oil conditioner	Winslow
Fuel oil transfer pump	Viking
Fuel filter (light fuel)	Nugent
Fuel strainer (heavy fuel)	Purolator
Fuel injection pumps	Bendix-Scintilla
Air intake filters	American Air Filter
Air intake silencers	Burgess-Manning
Exhaust mufflers	Kittel
Exhaust pyrometers	Alnor
Lube oil strainer	Purolator
Lube oil cooler	Ross
Lubricating oil	Union
Starting air compressor	Quincy
Thermostatic controls	Amot
Pressure gauges	Loneragan
Air intake temperature control	Powers
Alarms	Viking
Emergency lighting batteries	Exide
Jacket & raw water pumps	Pacific
Jacket water heat exchangers	Ross
Cooling tower	Marley



Left, one of two DeLaval centrifuges with Fram lube oil filters. There are three other of these DeLaval-Fram units in the plant on the fuel system—one for light fuel and two for heavy. Right, the Winslow lube oil conditioner. It is in the engine lube line and all lube oil entering an engine passes through this unit first.

Bank of 60 Exide storage batteries for emergency lighting.





UPCOMING MILWAUKEE SAE MEETING FEATURES TRACTOR DEVELOPMENTS

THE National Farm, Construction and Industrial Machinery Meeting of the Society of Automotive Engineers is expected to attract over 3,000 experts during the session in the Milwaukee (Wis.) Auditorium on September 12 through 15. Representatives from the farm tractor, earthmoving, power plant and fuels and lubricants industries will be on hand for the sessions and the technical program has been broadened to reflect the increased interest in this important meeting.

The Tractor Show, a feature of this year's meeting, will be a display of the latest in farm tractors and equipment and will provide a natural setting for the SAE luncheon on Wednesday, Sept. 14. Registrations for the meeting will be carried out at the Milwaukee Auditorium from 8 a.m. daily. The early, partial list of exhibitors includes names of 91 manufacturers who will be represented at the engineering display in the main auditorium. (See exhibit layout above.)

Production forums and technical sessions will be held throughout the four day meeting and listed below are the topics which will be taken up at these gatherings:

PRODUCTION FORUMS

MONDAY, September 12

9:00 a.m.
Heat Treatment (Kilbourn Hall)
Engineering-Manufacturing Relationships (Juneau Hall North)
Unique Manufacturing Processes (Juneau Hall South)
2:00 p.m.
Welding Methods and Process Control (Kilbourn Hall)
Production Control Tools for Scheduling and Shop Loading (Juneau Hall North)
Gear And Spline Design And Production (Juneau Hall South)

TUESDAY, September 13

9:00 a.m.
Operating Experience With Numerically Controlled Machines (Juneau Hall North)
Precision Tooling For Job Shop Operation (Juneau Hall South)
Production Problems Of Small Engines (Walker Hall)
1:30 p.m.
SAE Plant Tour: Allis-Chalmers Manufacturing Co.—West Allis Works

TECHNICAL SESSIONS

TUESDAY, September 13

9:00 a.m.
Some Factors Affecting Dry Air Cleaner Efficiency (Kilbourn Hall)
Lubricant Additives; Detergent Additives For Gasoline and Diesel Engine Lubricants; Molybdenum Disulfide as an Additive to Improve the Performance of an Automotive Multipurpose Grease (Engelmann Hall, 2nd Floor)
2:00 p.m.
Direction Determination (Juneau Hall)
Design Analysis and Component Life Investigation; Power

and Life Investigation of the Farm Tractor Drive Components (Kilbourn Hall)

WEDNESDAY, September 14

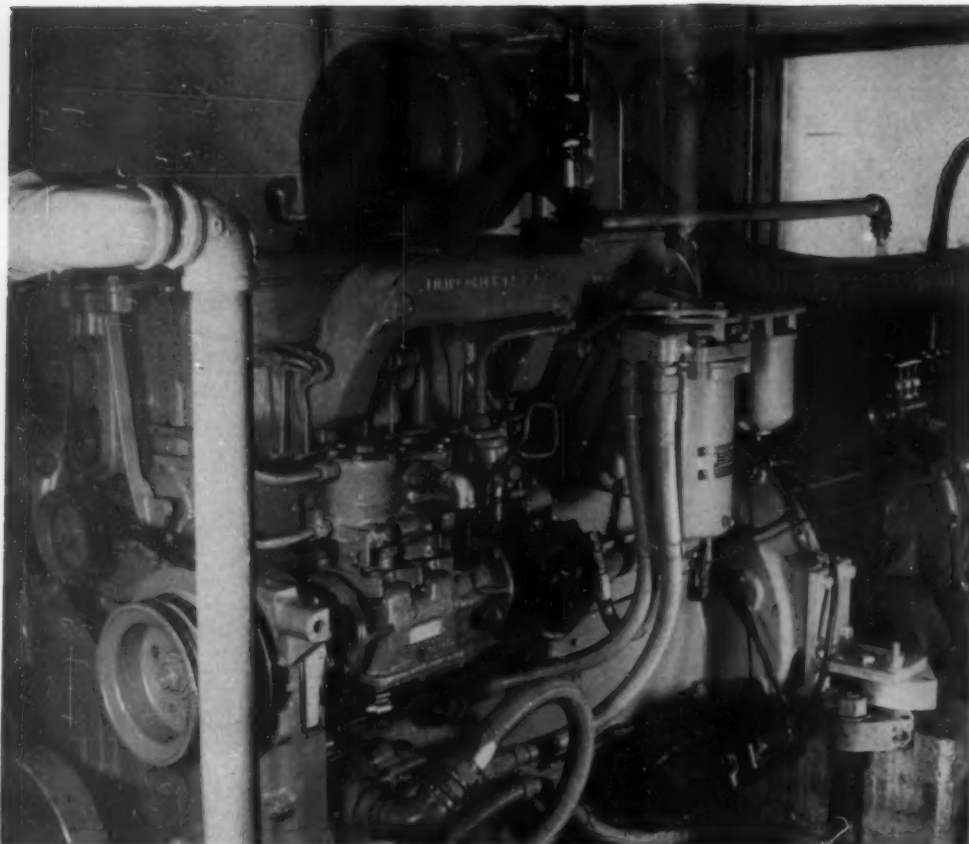
9:00 a.m.
Fatigue, Impact, and Tensile Properties of High Strength; Lead and Non-Leaded SAE 4140 Steel; Case Cracking of Carburized and Hardened Gears (Juneau Hall)
Fuel Additives; Additives for Liquid Hydrocarbon Fuels (Kilbourn Hall)
2:00 p.m.
Air-Cooled Vs. Water-Cooled Diesel Engines (Juneau Hall)
Screen Type Filters; Principles of Absorbent Media; Surface Type Hydraulic Filters; Mobile Hydraulic Systems Filtration (Kilbourn Hall)

THURSDAY, September 15

9:00 a.m.
Excavator Clutch and Brakes; Basic Properties of Friction Materials; Excavator Clutches and Brakes; Behavior of Drums and Linings (Juneau Hall)
New Tractors: Engineering Deere's Model 8010 Tractor John Deere's New Line of Tractors (Kilbourn Hall)
2:00 p.m.
Bearing Life Analysis for Torque Converter Driven Power Trains (Kilbourn Hall)

View of Milwaukee Auditorium main exhibit hall during 1959 SAE National Farm, Construction and Industrial Machinery Meeting.





◆ A large diesel engine undergoes bearing tests in the development lab of Bohn's Bearing Division at Greensburg, Ind.

ENGINE BEARING DESIGN

This Article is From a Paper Presented at the ASME Spring Symposium by Mr. John M. Robertson*. Excerpts On Lubrication, Efficient Use of Lubricants and Selection of Bearing Material Have Been Chosen

BASICALLY, a sleeve bearing must provide its own lubricating system. It must be designed so that the bearing will use that lubricant to the best advantage as long as the supply is sufficient.

Lubrication:

In supplying lubrication to the bearing to produce the most efficient use, three basic rules are to be followed: 1. Feed the oil into the bearing in a non-loaded area. 2. Never use a groove if it can be avoided. 3. Never use a cross or longitudinal groove at any point where a shaft can touch it. Regarding the entry of the oil, there are very few applications in which the oil pressure applied to a

bearing is sufficient to lift the journal off the bearing. We will, therefore, deal with the most common applications.

The bearing, in the usual application is furnished lubricant either by low pressure or gravity, and with enough surplus lubricant to carry away heat generated in the bearing and shaft, assuming the shaft rotational speed is great enough to generate heat. The flow of lubricant into the clearance area permits the lubricant to spread across the journal and be carried into the loaded area. As it

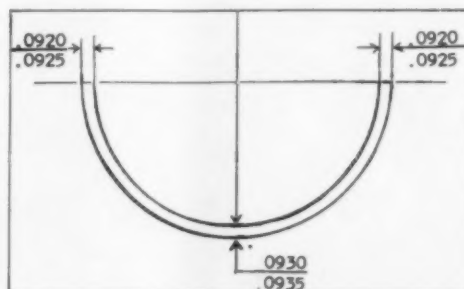
approaches the loaded area, pressures are built up which support the journal on the lubricant and prevent metal-to-metal contact. It can readily be seen that, were the oil entry to be in the loaded area, the journal could seal the entry hole or severely restrict the flow. Oil which did would have to be carried completely around the journal before it could be used to develop a satisfactory lifting pressure. If it is necessary for oil to be transferred circumferentially around the bearing, due to design limitations, a radial groove is most satisfactory. Many installations have been designed with a 360° groove.

When using a radial semi-groove, it should be in the area of minimum load and end in the area of maximum clearance. Otherwise, dirt or foreign material which collects at the ends of the grooves is carried through the loaded area rather than washed out. Unless foreign material is permitted to escape from the bearing, the bearing can be grooved or over-heated by the embedding of the foreign material in the bearing metal and result in premature failure. Cross or longitudinal grooves should only be used in special applications and, as we stated earlier, never in a loaded area or at a point where the journal may touch or approach the bearing surface. Edges of a groove of this type, regardless of chamfer or blending, at some point present a wiping edge to the journal and will remove oil rather than lubricate. If it is necessary, particularly in a long bearing, to use some sort of longitudinal groove, the groove should be so located that the journal cannot touch or approach it. We avoid grooves of this type except in particular applications with which I will deal later.

The best design practice which we have found for positive lubrication, effective oil film pressure development, and cooling oil flow is the use of eccentric wall bearings. The assembled bearing bore is not round. Bearing inserts are finished so that the assembled bearing bore is greater in non-loaded areas or, to say it the other way: extra clearance is provided in areas which carry no load. Oil is fed to these high clearance areas. It spreads the length of the bearing for cooling and wash-out. Since the bearing surface is a radius, from these areas to the loaded area there is no interruption to interfere with maximum pressure build-up.

Efficient Use Of Lubricant

Reference has been made to the fact that a bearing is an operating entity in itself. That is, if it is designed properly and fed sufficient lubricant, the bearing will develop within itself an operating clearance, pump its own oil film on which to perform the desired function for which it was intended: carry the load, without metal-to-metal contact. The development of an operating oil film results, of course, from the rotation of a journal within a bearing, and friction in the oil between shaft and bearing. The rotation of the journal



◆ Figure 1. Eccentricity of the bearing wall is indicated by specifications of the wall at the partline and at the crown or centerline of the bearing as indicated above.

*Executive Staff Engineer, Bohn Aluminum and Brass Corporation, Detroit, Mich.

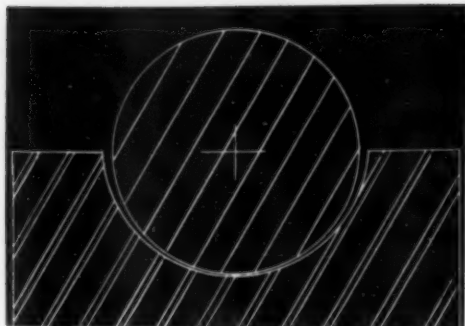
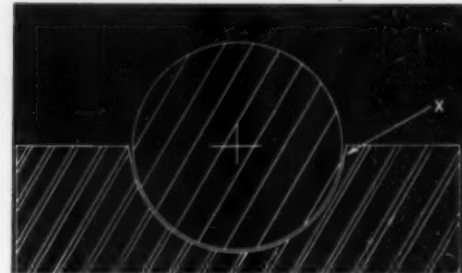


Figure 2. Typical eccentric wall bearing installation. Note clearance on side permitting flow of oil full length without sacrifice of low clearance in direction of reciprocation.

Figure 3. Typical straight wall bearing with partline relief. Note possibility of interference at (X) with any distortion or misalignment. Hydraulic oil film buildup thus is minimized or prevented.



carries the lubricant into the area between itself and the surface of the supporting bearing. If those two surfaces are parallel, (that is, the bearing bore is round), it is obvious that pressure cannot be built up which will separate them and continue to hold them apart. When there is no limitation on clearance in the application, high clearances create out-of-parallel surfaces since the shaft does not stay on the bearing center, but will lay of its own weight, with its center below the axis of the bearing. Oil can be carried from the high clearance area around to the loaded area through the converging surfaces of the journal and bearing. This situation regarding clearance very seldom occurs. Usually the design requires that the shaft center must rotate as closely as possible on the axis of the bearing. This means minimum clearance is desirable. Minimum clearance cannot be tolerated for 360° of the bearing. In fact, it has been our experience the 90° to 120° bearing or minimum clearance area is most satisfactory. This is accomplished by the use of eccentricity in the bearing bore as mentioned earlier. The amount of eccentricity required will vary with the journal diameter. The use of proper eccentricity permits a reduction in operating clearance of 50 per cent of the rule of thumb. (.001/in. journal diameter).

The eccentric bore in a bearing is a design in which the I.D. of the bearing is machined to a greater radius than the journal radius plus one-half the operating clearance. The surface of the journal and bearing converge from the area of

maximum clearance to the loaded area, and is an optimum means of hydrostatic pressure development. This is a definite advantage to the designer in that he can hold clearance in the direction of loading, to a reasonable figure. Noise is reduced and shaft movement restrained. This is particularly important if the loads carried by the shaft are reciprocating. Oil flow through the high clearance area improves cooling as well as wash-out of foreign material before it passes through the loaded area and reduces the possibility of damage to bearing or journal surface.

Selection Of a Bearing Material

Commercially-produced and readily-available bearing materials for consideration may be divided into three broad categories, with bronze material again divided into materials to fit particular types of application. The three basic groups are: 1. Babbitt on steel backing; 2. Bronze, solid or on steel backing; 3. Aluminum alloys, solid or on steel backing.

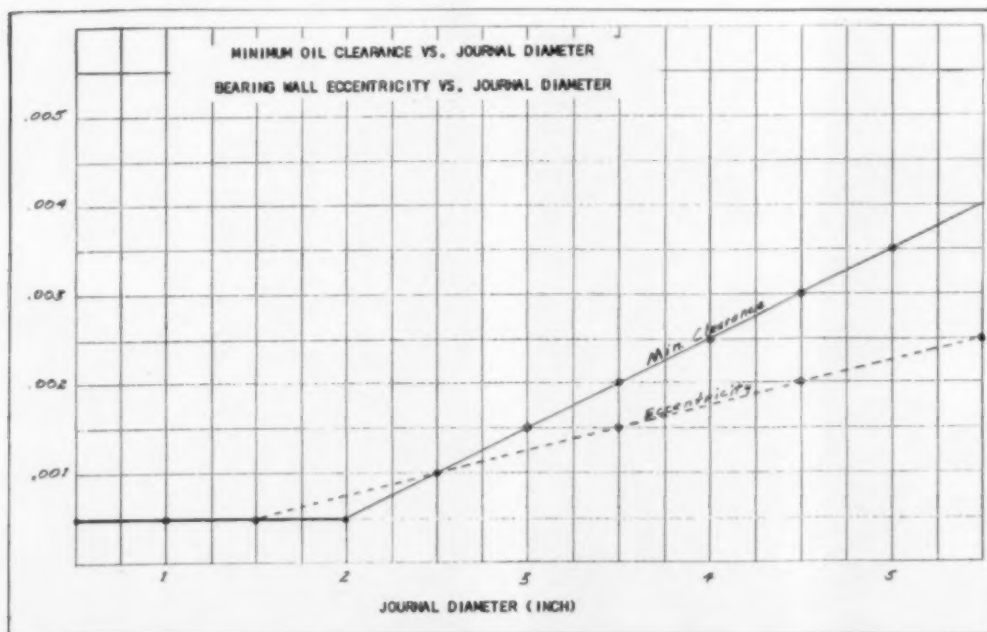
Babbitt can generally be used on low load, low heat applications. In low speed application with thick lining, rotating loads should be limited to 1000 psi; in high speed and with the lining .005 max., loads up to 2000 psi have been carried. Bronze alloys vary in characteristics with the variation in lead content. In high speed applications with good lubrication the higher lead content alloys (24 per cent to 35 per cent carry loads up to 3500 psi. Bearing material requirements under

heavy oscillating loads, which have inherently poor lubrication require alloys with relatively poor bearing characteristics and high hardness. These conditions can usually be handled very nicely with the low-lead bronze alloys.

Aluminum alloys are being used more and more widely for bearings with loads up to 8000/9000 psi and good "lube". The spread of usage has been pronounced since the advent of good bonding techniques of aluminum alloys to steel backing. The most widely used alloys for engine bearing and many bushing applications are those containing approximately 6 per cent tin. There are other alloys with limited acceptance containing Cadmium and Silicon in percentages up to 4 per cent. In applications of poor lubrication and heavy and or oscillating loads, aluminum alloys containing higher quantities of copper, silicon, and nickel are used. These are alloys which can be cold-worked or heat treated for a higher hardness.

One of the great advantages of aluminum alloy (solid or steel backing) is its resistance to corrosion from acid oils. The superiority of aluminum alloy to bronze in a turbocharger application has recently been demonstrated; where bronze had widespread corrosion in the field, a change was made to aluminum alloy and the problem was eliminated. The use of solid aluminum half-bearings and bushings has had good acceptance. Limitations result on greater acceptance from the differential of the coefficient of expansion between aluminum and the housing which generally is of iron or steel. Original installation could be made with satisfactory press on the part to prevent rotation. However, it is not unusual for the stress in the shell to be increased by the heating of the bearing to a point where the bearing took a permanent deformation. When cooled down the shell proved to be loose in the housing. It is advisable to dowel or lock the part mechanically in place in order to prevent rotation.

It can be generally stated that in an aluminum housing (not subject to broad temperature range or where a heavy wall can be used in an iron housing), solid aluminum may be used very satisfactorily. Aluminum on steel backing eliminates problems of maintaining press fit and temperature ranges limitations while providing the inherent good bearing qualities of the aluminum alloys.



Recommended minimum oil clearance and eccentricity, main bearing, connecting rod bearing applications.

NEW YORK TRAP ROCK'S 1800 HP TOWBOAT *M/V ROCKLAND COUNTY*

By DOUGLAS SHEARING

MODERN, efficient and specifically designed for Hudson River conditions, the *Rockland County* is now in the service of Cornell Steamboat Co., subsidiary of New York Trap Rock Corp. Powered by two Fairbanks-Morse OP diesels with a combined 1800 shaft horsepower, the new pusher-type towboat was designed by Dravo Corp. in Pittsburgh and built at Dravo's East Coast shipyard in Wilmington. According to C. W. Spangenberg, New York Trap Rock's director of transportation, results of initial service are highly satisfactory. The *Rockland County* is capable of pushing twenty-barge tows of crushed stone between Trap Rock's three quarry locations along the Hudson and the distribution depot in New York harbor.

Launched in early March, the vessel was christened in late June at West Nyack, N.Y. She was named the *Rockland County* in honor of the location of a majority of New York Trap Rock's quarries and the home of most of the 800 employees. Moulded dimensions of the new boat are 105 ft. length, 30 ft. beam, depth at side amidships, 11 ft. 9 in., with an operating draft of 8 ft. The company has gone to push-type towing because of its increased efficiency over side or pull towing. Greater control can be exercised over the tow and it can navigate with ease through narrow channels, to and away from docking points, particularly in unfavorable tide or current conditions.

Main propulsion plant on the *Rockland County* takes its power from two Fairbanks-Morse marine

type opposed piston diesel engines. These model 38D 8 $\frac{1}{8}$ 5 cylinder engines have a bore of 8 $\frac{1}{8}$ in., a stroke of 10 in. and are rated to deliver 900 bhp at 800 rpm engine speed and 215 rpm propeller speed with blower scavenging and 86.3 B.M.E.P. Each engine is quill shaft coupled to Western Gear model 80 PCMR-A reverse and reduction gears through Wichita model ATD224H-L1 pneumatic clutches. The twin propellers turn inboard at the top when clutched in, with an ahead ratio of 3.72:1. The astern ratio is 3.55:1. Skin coolers are built into the hull shell plate providing a closed cooling system for each engine's jacket water. Engine and gear lube oil is jacket water cooled.

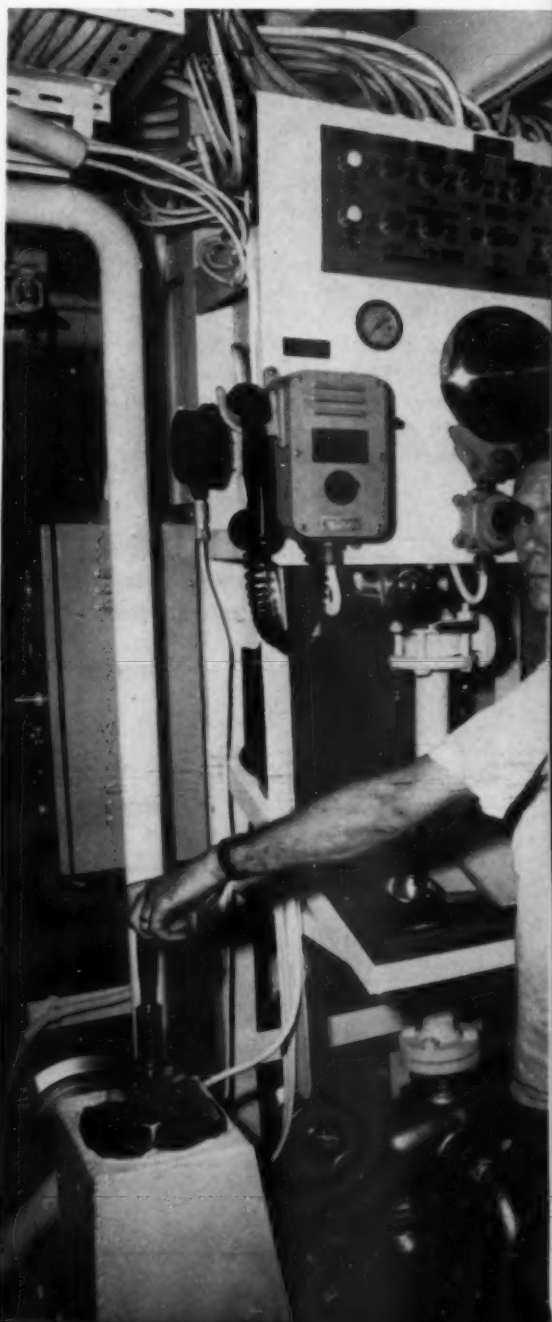
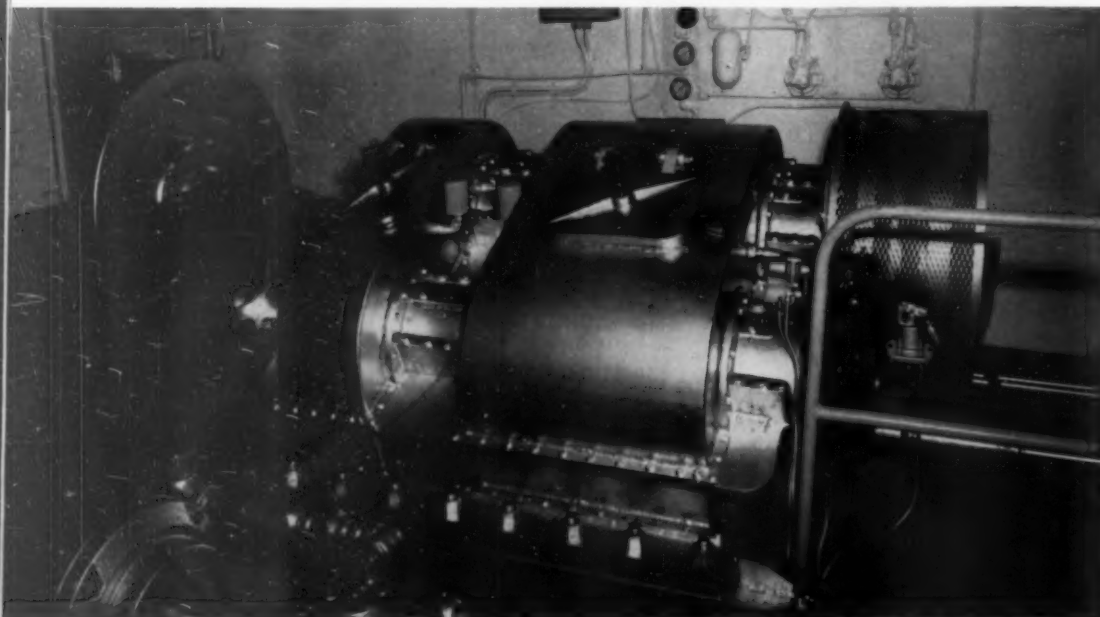
When underway the vessel may be operated from the pilot house or a station located aft on the upper deck. In an emergency the engines and clutches can be switched to engine room operation. The engine room control station is located between the engines at the forward end with gages, alarms and sound powered phone close at hand. A unique feature of this push type towboat is its ability to slip clutches to provide propeller revolutions less than that normally provided at engine idle speed. This slip feature is arranged with a propeller shaft speed governor that regulates air to the clutches thereby allowing the Captain to command propeller rpm with assurance.

Hull of the *Rockland County* is divided into five watertight compartments. Main engines and reverse-reduction gears are located amidships, with diesel

fuel oil stored in wing tanks, deep tanks and a centerline double-bottom tank just forward of the machinery space. The forepeak is used for ballast water, and the forecabin for deck gear storage. Drinking water is stored in independent tanks in the forward hold. A watertight door provides access from the machinery space to the shaft alley compartment and escape trunk. The aftermost compartment houses the hydraulic steering engines.

The superstructure includes the main deckhouse, upper deckhouse and pilothouse. In the main deckhouse are quarters, lounge and other facilities for two guests and a crew of eight, an all-electric

On the *Rockland County*, each Fairbanks-Morse diesel is quill shaft coupled to a Western PCMR Sea Master reverse—reduction gear through Wichita pneumatic clutches.





▲ The *Rockland County* pushes a 21,000 ton tow of barges. Performance trials were held on the Hudson river outside Poughkeepsie and were conducted under supervision of Sparkman and Stephens, naval architects of New York City.

◆ Lower operating level of the new towboat with one of the two FM diesels to the right and emergency engine control stand center. Controls are of the single lever, pneumatic type.

Two Caterpillar model D-318 60 kw diesel generating sets are installed for auxiliary power. ➤



galley-messroom seating seven, upper engine space, and deck stores space. Quarters and facilities for three officers are contained in the upper deckhouse. The pilothouse, located atop the forward end of the upper deckhouse, houses all navigation aids and controls for complete towboat operation, with the exception of engine starting. Two Caterpillar model D-318 diesel generator sets, rated 60 kw at 1800 rpm, supply 120/208-volt, 3-phase, a-c power for ships service.

The *Rockland County* has two steering gear systems, one for flanking and one for steering ahead. Each engine system consists of a control valve, control and follow-up mechanism, and four pivot-mounted, double-acting hydraulic cylinders driving the tiller arms. Hydraulic power is provided by two motor-driven pumps. Normally, one pump will be in operation, supplying oil to both steering systems. A second pump cuts in automatically when pressure from the first pump drops to an abnormally low value. The controls are such as to permit either pump to be used for continuous service, with the other as a standby. Steering is controlled from the pilothouse console by means of push rods running to the steering compartment. Through the follow-up system, rudders remain at

the same angle as the levers in the pilothouse, giving constant indication of rudder position.

Six balanced rudders control the vessel's course. One is located aft of each propeller for steering ahead and two forward of each propeller for flanking. The four-bladed propellers are 7 ft. in diameter, and made of high tensile, stainless steel. Their pitch, area and blade form have been designed by Dravo for use with the Kort nozzle. Just aft of each propeller is a single-armed, steel strut which supports the propeller shaft.

List of Principal Equipment

Engines	Fairbanks-Morse
Reverse & reduction gears	Western Gear
Pneumatic clutches	Wichita
Governors	Woodward
Lube oil filters	Hilliard
Lube oil strainers	Air-Maze
Fuel oil filters	Nugent
Lube oil coolers	Ross
Air compressors	Quincy
Intake air filters	Air Maze
Propellers	Columbian
Diesel generator sets	Caterpillar
Pneumatic controls	Westinghouse Air Brake

MACE GROUND SUPPORT SET DELIVERS PRECISE POWER

By JIM BROWN

A DIESEL generator set designed for precise power ground support of the U.S. Air Force, Martin-made "Mace" missile not only meets, but considerably exceeds the precision required of it by the design and production contract.

The all-weather, day and night Mace weapon system is scheduled for operation in Europe and on Okinawa in the far Pacific. Units of the earlier, shorter-range TM-76A equipped with map-matching (ATRAN) guidance system already are deployed in West Germany. The Mace B is designed to deliver high explosive conventional or nuclear warheads on targets up to 1200 nautical miles. In a recent "white paper" on U.S. deterrent power, the Department of Defense listed four operational squadrons containing a "mix" of Mace and its predecessor Martin-built Matador. Any one of these squadrons, "exceeds by far the total explosive power expended against all Axis military targets in Europe during WW II."

Based on a Cummins NRT0 BI-6, 6-cylinder turbocharged 300 bhp diesel engine (5 1/8 x 6 in. bore and stroke) and an Electric Machinery 150 kw (187.5 kva at .8 power factor) 1800 rpm single-bearing generator, the unit was built under a contract awarded to Wolverine Diesel Power Co., Detroit, Mich. Built to be operable at temperature extremes of from + 125 degrees F. to -65 degrees F., requirements were that the set should maintain a frequency control of 1/4 of one per cent and

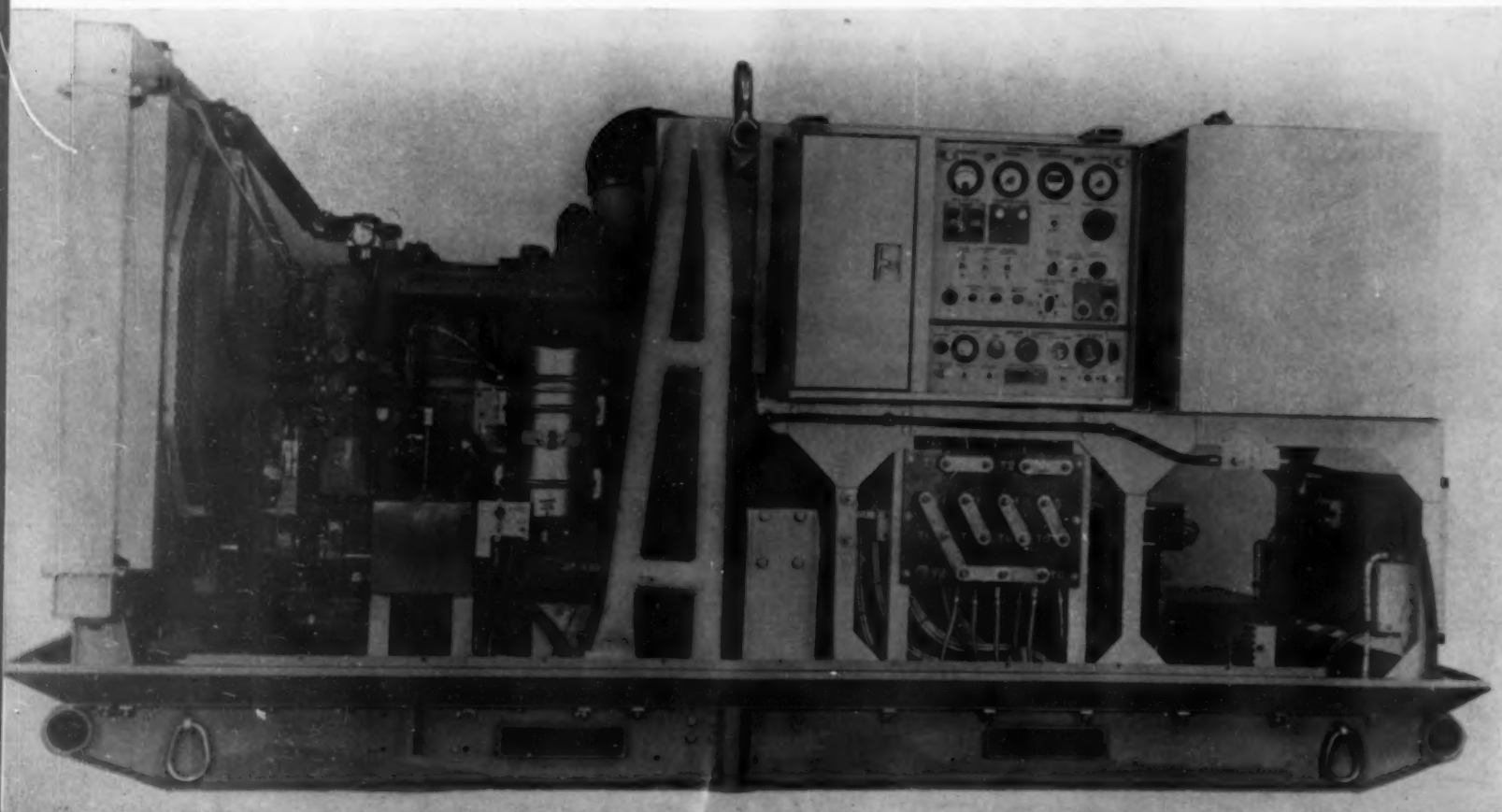
that it should recover to this frequency tolerance within 2 seconds of the instant when the load is suddenly applied from a no-load condition. Recovery from rejection of full load to no load must be within three seconds. Also the frequency was not to decrease below 57.6 cycles when full load was suddenly applied.

Trial runs of a "bread-board" test stand installation and of a fully equipped prototype model show the following results: The actual frequency excursion when full load is suddenly applied reaches to a frequency of approximately 58.4 cycles. On load rejection, the frequency excursion reaches to a frequency of approximately 61.5 cycles.

Recovery from "no load" to suddenly applied "full load" frequency control is within 1.9 seconds instead of the two seconds allowable. When the full load is completely rejected, recovery to the previously established frequency is within 1.8 seconds. The important factor of frequency control under a continuous load worked out like this: While the maximum allowable variable is plus or minus 0.25% ($\pm .15$ cycles) the frequency control of Wolverine's diesel generator set while under any constant load varies only about 0.15% (.090 cycles). On the last checks made before this was written, Wolverine's engineers were doing even better than this—they had a steady state frequency variation above and below the 60-cycle line as shown on their oscillograph which came to only

about .075 of one cycle, plus or minus. This is close regulation, indeed!

We asked Fred Traino, chief engineer at Wolverine two things about this close regulation: first, why it was necessary, and second, how they obtain it. He said that the generator set in question might be the primary power source for a defense station where several of the intermediate range Mace missiles might be stored in a state of readiness. The power load therefore could include a lighting load,



USAF TM-76B Mace streaks away from launch pad at Cape Canaveral, Fla., on a test of its inertial guidance system, other components.

perature rooms in this area, and has been "borrowed" for use by engine manufacturers in and around the Detroit area.

To one side of the main work room the company has another testing room containing an engine stand. They bring this room up to $+125$ degrees F. by recirculating the cooling air from the engine and by means of banks of electrical heater grids which are used as a "load" for the generator. The staff, under W. B. Corcoran, president, includes J. F. Corcoran, vice president, Mr. Traino, William Franklin, the project engineer, H. G. Corcoran, production manager, and an experienced group of designers and technicians.

The generator set, which is called an Air Force type MB15 unit, is prepared to cope with great extremes of temperature. It is fitted out with an oversize radiator to cope with high temperatures, and with two independent heating systems to take care of low temperature conditions.

Two conditions of low-temperature operation are prepared for. If the unit is on "standby" in a heated building, no starting problem is anticipated, but an electrical heating system is provided for use where utility power is available and a forced air, fuel-oil burning heater is provided as well. The oil-burning heater, driven by power from the starting batteries, circulates hot air through the crankcase and oil passages in the engine block, as well as through the battery case. This miniature

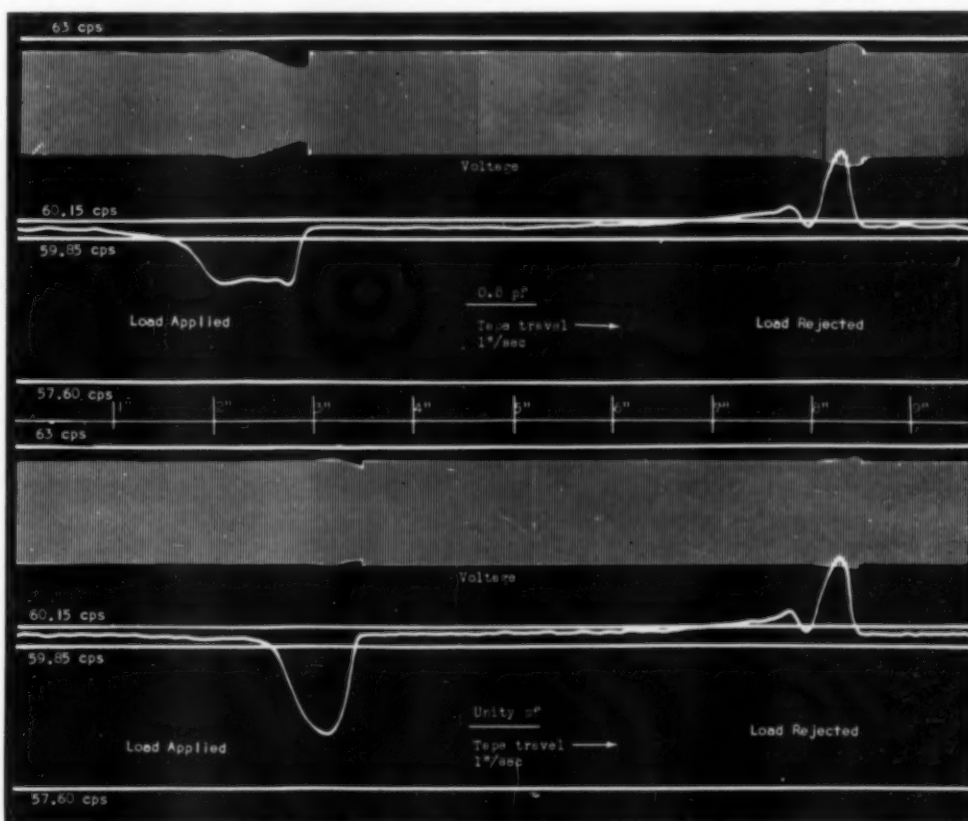
furnace, which could be operated on a standby basis for 24 hours without appreciably weakening the starting batteries, can bring the unit from a "soaked," -65 degrees F. condition to readiness for starting in one hour. Since the electrical heating system depends upon public utility power, it is available only when such power is available.

The Wolverine Diesel-Martin-U.S. Air Force ground support unit has other points of interest worth noting. Close voltage regulation throughout the entire load range is provided by a magnetic amplifier type of voltage regulator. The unit has been tested with equal success on No. 1 and No. 2 (MIL specs) diesel fuel, and on JP4 fuel, which speaks well for Cummins relatively recently introduced P-T fuel system. The unit's base contains slots for fork truck lifting, and there is also provision for single-point lifting by hoist. The base and frame which support the engine, generator, controls and hood are of welded steel. Combined weight of the unit is approximately 8,650 lbs. and it measures 72 in. high, 144 in. long and 48 in. wide.

Principal Equipment Serving Cummins Engine

Generator	Electric Machinery
Radiator	Perflex
Lube oil filter	Luber-finer
Fuel oil filter	Fram
Air cleaner	Vortex
Governor	Woodward
Muffler	Donaldson
Oil burning heater	Perfection
Starter	Delco-Remy

Tracings from oscillograph record showing performance of precision missile ground support set. Line between tracings is marked off in inches to indicate scale. Tracings are interpreted in text.



perhaps an intermittent general utility load, while at the same time one or more of the missiles was being "checked out" as part of the routine. There are motor-driven mechanisms and instrumentation of a highly critical nature involved in any of the modern self-propelled missiles. Electrical current of a highly stable nature is therefore a prime requirement in such an installation, whether it is obtained from a public utility or from a standby power generator.

Mr. Traino credits ability to put together a set with such close regulation to three factors: Wolverine's experience in furnishing both diesel-driven and gasoline-driven ground support units to the armed forces; the ample power and quick recovery of the Cummins engine chosen for the job and the efficiency of the Woodward temperature-compensated PSG precise hydraulic governor which controls the engine's fuel supply. A team of Martin engineers, under the guidance of J. J. Miller, also provided important direction in the original design of the set.

Wolverine's equipment includes a large "cold room" which can be brought down to -65 degrees F. in a few hours. They use this room for low temperature tests not only on complete units but on various components. This, incidentally, is one of the very few commercially available low tem-

Control side of Wolverine's precise power ground control generator set with hood and side panels removed. Engine is Cummins NRT0 BI-6, 300 bhp turbocharged unit; it drives a 150 kw Electric Machinery generator. Note Luber-finer lube oil filter. Control panel carries electrical gauges and controls above, engine controls and gauges below.

100 TON ARMY AMPHIBIAN

CONTRACTS for six 100-ton amphibious, self propelled barges that can carry loads of 60 tons of supplies from an offshore ship to transfer points inland have been awarded by the Army Transportation Corps. Transval Electronics, El Segundo, Calif., was awarded the \$1,386,000 contract to build the giants, known in formal Army nomenclature as Barge, Amphibious, Resupply, Cargo and dubbed "Barcs" by the GI.

The Barcs have been in service for the Army Transportation Corps for some time and are "big brother" to the familiar DUKW's of World War II fame. They normally carry payloads of 60 tons but in emergency can haul loads equal to their own 100 ton weight.

Each of the nine foot wheels on which the Barc rolls is propelled by a General Motors 6-71 diesel engine driving on land or water through a series of torque converters, transmissions, marine gear and miter boxes. On water, speed of the Barc is a top 7½ mph; speed ashore with a normal load is a maximum 14 mph.

The four GM 6-71 engines, two cycle, six cylinder units with bore and stroke of 4¼ × 5 in., are governed for a maximum of 2100 rpm, which provide an output of 165 cont. hp.

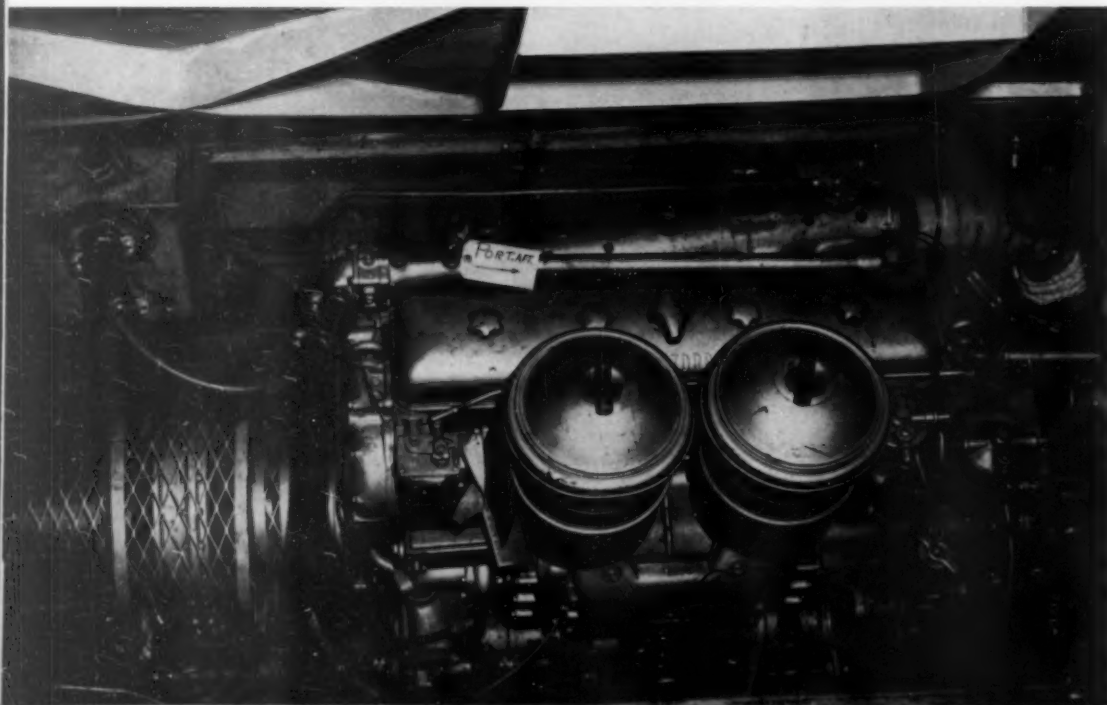
The engines and their accompanying converters, transmissions and miter boxes are installed in compartments running parallel to and on either side of the cargo space. Each of the 6-71's forward is installed with the rear of the engine facing forward, each after engine is installed with the rear facing aft. The units are in two models, 6080 for the left hand rotation and 6081 for right hand rotation. On the port side the 6080 model is aft and the 6081 is forward. Starboard arrangement is the reverse of this. Under this arrange-

ment, components which drive the wheels are powered from the rear of each engine while components which supply power for marine operation are driven from the front of the engines.

Let's take a look at the power trains, first for marine operation, then for land travel. As stated above, the marine drive is from the front of the engines. Power is transmitted from the engine through Twin Disc fluid couplings into gathering boxes, one for each pair of engines on each side of the Barc. The gathering boxes and marine gear, which is located below the cargo space at about the center of the Barc, are connected by special vertical couplings. The marine gears, one for each gathering box, each drive a 48 in. diameter propeller through 2½ in. shafts which are 11 ft. 7¼ in. long. Propeller rotation is counterclockwise. The shafts carry monel sleeves which ride in bronze bushings. The marine gears also drive air compressors, which supply brake and tire air pressure, through direct couplings. For marine operation the function of the marine shifting and throttle control are combined on one lever in the cab. The air compressors operate constantly, whether on land or water. They are driven by power takeoff or auxiliary shafts, from the marine transmissions. Clutches prevent operation of the marine final drive while on land.

For the land drive, Allison TC 554 torque converters, one at the rear of each engine are coupled to individual transmissions with gear type couplings. The transmissions are a Allison model TG-602's, specially adapted for this application. Another gear type coupling connects transmissions to miter boxes, effecting a right angle drive to the wheel column. Power further transferred through gear type couplings to the final drive unit, consisting of a right angle drive from the wheel column to a set of planetary gears in each wheel

One of four GM 6-71 diesel engines, one for each wheel, which power the BARC. Engines are rated 165 hp at 2100 rpm. Note CFC Fulflo fuel oil filter, AC lube oil filter. Twin Disc fluid coupling at left end (front) of engine, drives gathering box for marine operation; wheels are driven through Allison torque converter at rear of engine.



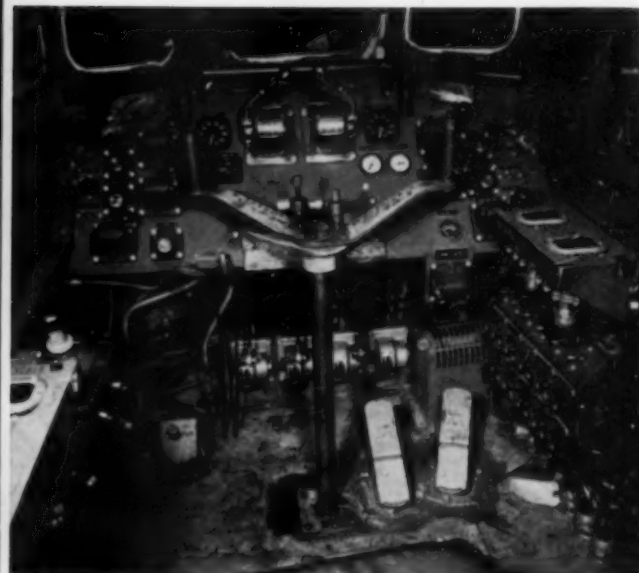
➤ **Stern view of the BARC.** The craft, built for the Army Transportation Corps can take cargo from a ship offshore and carry it to inland points. Twin rudders steer afloat, all four wheels or front wheels only can be used for steering ashore. Unit stands 19 ft. from ground to top of cab, weighs 100 tons.

➤ **Transmission, left, and miter box** are part of power train for driving the wheels on the BARC. Miter box feeds power to wheel couplings and planetary gears which drive the nine-foot wheels. Transmission is modified Allison model TG-602, miter box and other gears were built by Western Gear.

hub. All the miter boxes, gathering boxes, marine gears, wheel column and wheel drive are manufactured by Western Gear.

The power train provides a system of drive that is suited for continued operation in event of failure of one or more of the above components. These components, through gear reduction, achieve a tractive effort of approximately 61,000 lbs. at the tire, with a torque of approximately 283,333 lbs. ft. at stall conditions. The Barc can be driven on one engine or any combination and can even be driven with one wheel off by shifting cargo. Braking is accomplished with drift shaft units attached at each miter box. Gear shifting is controlled by Westinghouse Air Brake valves and a hydraulic system.

Steering is hydraulic with a working pressure of 1500 psi. All four wheels steer on land with two marine rudders steering in the water. Steering control ashore is with two levers mounted on a column in front of the driver. Movement of the two levers indicates the direction of turn. Front wheels are controlled by the left lever, rear wheels by the right. Each lever can be locked out if desired. The right lever is locked when two wheel or marine steering is desired. Marine steering is by means of a wire rope, over sheaves, to the

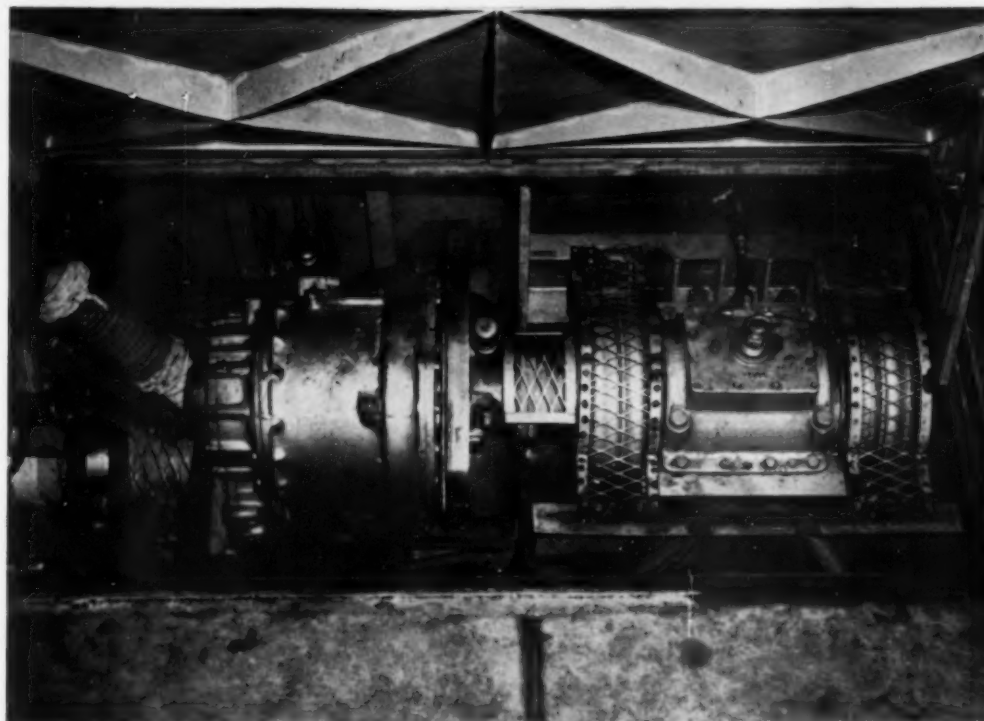


Construction view of pilothouse of the BARC. Control lever is used for marine or land steering. Note Westinghouse Air Brake controls for marine operation.

Loading is by a bow ramp. The three man crew can maintain radio contact with other units. The driver controls the Barc from a wheelhouse at the stern. Marine safety equipment required by the Coast Guard is standard on each Barc.

The Transval contract is the second production contract for the Barcs. The first four experimental models were built by Pacific Car & Foundry Co., Renton, Wash. The first production contract for 14 units was filled by the Treadwell Construction Co., Midland, Pa. All of the Barc's have been powered by the 6-71 diesels. They have been used in operations from Formosa to the DEW line but are little known by the public as yet.

Construction is under the direction of the Army Transportation Materiel Command with headquarters at St. Louis, Mo. Brig. Gen. William B. Bunker heads the materiel command.



starboard front wheel steering arm and rudders operate with the front wheels at all times.

The amphibian has an operating range of 150 mi. ashore and 75 mi. on water, and can carry 600 gals. of fuel oil; lube oil capacity is 60 gals. and hydraulic oil capacity is 300 gals. The electrical system is 24 volts, with two 12 volt batteries in series for each engine. The Barc measures 62½ ft. long, is 26½ ft. wide and is 19 ft. high. Draft, to bottom of the wheels is 6 ft. forward and 7 ft. 2 in. aft when empty and 7 ft. 11 in. forward and 8 ft. 8 in. aft with normal 60 ton payload.

The BARC afloat. Engines, transmissions gathering boxes and miter boxes are located below hatches running the length of the port and starboard sides.





Left—the modern, attractive front entrance to Allis-Chalmers' new engineering and research center at Harvey. The overall arrangement of the three buildings comprising the facility, above, is evidence of sound planning. Building in foreground houses administrative offices, specifications and standards department, drafting rooms, etc. The next building, linked by overhead bridge, has fuel systems and research engineering, laboratories for stress analysis, fuel injection, instruments and hydraulics.

THE HEARTBEAT AT HARVEY IS DIESELS

Allis-Chalmers, with New \$3½-Million Engineering Center Completed, Starts Multi-Million Dollar Engine Plant That Will Provide Additional 515,000 Sq. Ft. of Manufacturing Space

EACH year the engine builders invest millions of dollars in expanding their research and manufacturing facilities—dollars for new plant and equipment that will produce new, more efficient power plants for operators in this country and abroad. One of the builders taking a front seat in this program is Allis-Chalmers Manufacturing Co., now in the midst of a multi-million dollar expansion of its engine manufacturing facilities at Harvey, Ill. This project follows closely on the heels of the Company's completion of its \$3½ million engineering and research center.

While not a big town considering the glitter of neighboring Chicago on one side and the belching

blast furnaces of Gary on the other, Harvey has long been known as one of the country's diesel engine manufacturing centers. Allis-Chalmers acquired the 63 year old Buda Company facility in 1953, and since that time has been engaged in a full scale program of updating and expanding the facilities for production of new and improved engines for its own line of construction machinery, farm and material handling equipment, diesel-electric sets, industrial power units, as well as for OEM applications, oil field service, marine propulsion, off-highway vehicles, etc.

Construction of the new plant, started in spring, is progressing rapidly and completion is estimated



for mid-1961. A one-story building of high steel beam construction and measuring 1,100 x 440 ft., the new facility will add 515,000 sq. ft. to the 654,000 sq. ft. of plants No. 1 and 2 comprising the Harvey Works at present. A high production, manufacturing operation employing a straight line production system in machining and assembling is planned. Floor area that will be vacated in existing buildings when engine production moves to its new facility will be made available for expansion of material handling equipment production, also carried on at the Harvey Works.

Here are views of the plant and highlights of the newly completed engineering-research center.

DIESEL AND GAS ENGINE PROGRESS



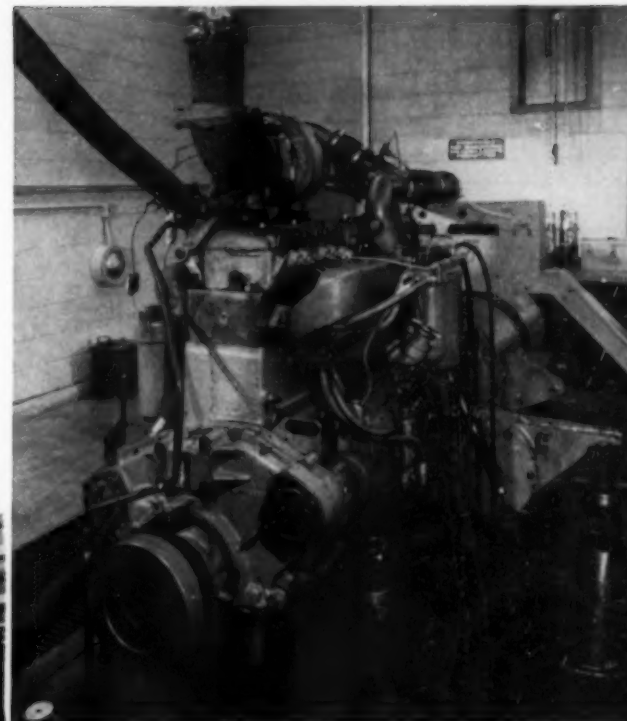
Right—L. C. Daniels, general manager, Engine-Material Handling Division of Allis-Chalmers with the silvered shovel he used at the ground breaking for the new manufacturing plant. Shown with him from left are: A. W. Van Hercke, director of engineering, Tractor Group and a Company vice president; W. B. Kane, mayor of Harvey; Daniels J. Ernst, general works manager, Tractor Group and a vice president; O. J. Higgins, general manager of the Harvey Works; E. J. Mercer, general manager, Construction Machinery Division and a Company vice president; and J. C. Baseheart, engine sales manager of Engine-Material Handling Division. To the lower left is an architect's drawing of the engine facility (center) and the completed engineering and research laboratory (right). Plant 2 is shown to left.



One of 22 dynamometer equipped test cells. Development cells have one dynamometer, and endurance test cells, two. Cells range from one used to test driven equipment such as pumps, etc. to the largest rated at 1000 hp. Cells are completely instrumented to read temperatures, pressures, engine and turbocharger speeds, torque and fuel consumption with accuracy of 1/500 of an ounce. Air supply passes through curtain type filters to four axial flow fans with combined capacity of over 300,000 cfm.



21000 Allis-Chalmers turbocharged diesel in one of the endurance test cells. For safety reasons, there is not any permanent fuel piping inside the building. All fuel pipes have quick connectors at each cell and the fuel enters the cell through a small opening in the outside wall of the building. Unique arrangement is provided to hold air temperature and pressure constant. Air inlet louvers in the ceiling are thermostatically controlled so that cell temperature is maintained between 95 and 100 degrees. Air outlet louvers are controlled by air pressure so arranged that fans remove a little more air than that admitted establishing a slight negative pressure. This achieves nearly constant air pressure and prevents any engine fumes from reaching operator's position.



Equipment to test the complete fuel injection system is provided by this laboratory type stand which, together with the electronic equipment shown to the right, checks pump calibration and phasing, rate of injection per degree crank angle, point of nozzle opening with relation to the pump camshaft, and injection cut-off.

HOW TRANSCO MAINTAINS 99% ENGINE AVAILABILITY

Company Personnel at Transcontinental Gas Pipe Line Corp. Have Contributed Ideas—and Even Inventions—to Maintain This Record While Operating Up to 429,580 HP in Compressor Engines

By DONALD M. TAYLOR

FROM the standpoint of engine availability factors, Transcontinental Gas Pipe Line Corp. has ranked among the top two or three operators in the gas transmission industry for over nine years. Transco has consistently maintained an engine availability factor of 99 per cent, and this is quite a feat considering that the company has 25 large compressor stations with a total 429,580 hp.

The Transco system is almost 2000 mi. long, running from Texas to New York. Most of the distance is spanned by two pipe lines—one 30 in. in diameter, the other 36 in. Every day, the large compressor stations, that range from 7640 to 21,800 hp in size, move 1¼-billion cu. ft. of natural gas into the market area, and because the market has

At Station 23 where mechanic is shown testing spark plugs, actual engine operating pressure and temperature are duplicated by this unit. Principal components are pulse generator, lower right, and coil, upper left, which are same as found on engine. High pressure nitrogen fuel is supplied from bottle attached to this portable cart. Firing pattern is visually determined through Heathkit Analyzer at lower left.



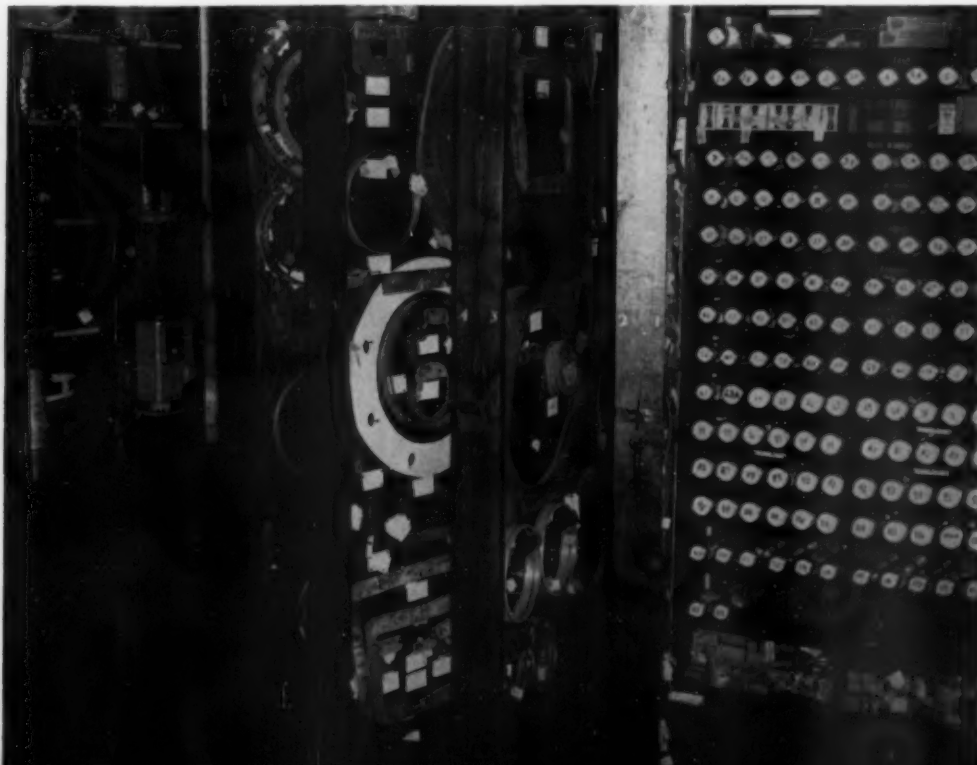
pressed the company for more and more gas ever since it commenced operations in January 1951, Transco has needed all of its engines. Transco's annual engine overhaul comes in late spring every year, and as the engines are repaired and lined out one by one, they rarely go off the line for unscheduled downtime during the ensuing year.

How does Transco do it?

It's simple—initiative. Initiative on the part of station superintendents and coordination between the superintendents in the Houston headquarters office and compressor station personnel. With well trained and experienced men running Transco's stations, the responsibility rests with individual station superintendents. This mutual respect between field and headquarters is seldom matched in any industry, but mutual respect always brings out the best in men; and this is certainly true in the Transco organization. When I visited several of the company's stations I found both operators and superintendents thinking about their jobs and devising better ways to maintain and operate the engines under their care. At two of the stations, I found these men had invented devices to aid in engine maintenance. At another station, I found the superintendent and his assis-

tant working after hours devising tools and methods to speed annual engine overhauls.

If you are beginning to wonder if this is a somewhat exaggerated account of routine men doing routine jobs, take a look at the accompanying illustrations. Each of the ideas shown here represents a definite contribution made to Transco organization by one of the men in the compressor department. What's more, the men made these contributions without the usual stimulus of prizes or payment for ideas. Their only reward comes in the form of honest appreciation. When the station superintendents "hatch" up an idea, they send sketches of such ideas to the headquarters office so they can be re-drawn, duplicated and sent to other station superintendents on the company's system. But even though drawings of the new ideas are sent out to individual station superintendents, they are not required to use the ideas unless they want to. Transco never tells a station





Transco's Station 13 near Comer, Georgia has a rated horsepower of 18,720. The main compressor building houses seven Clark BA-8's and two Clark HBA-8's.

Among the initial steps in grinding valves, valve puller is set in position, cylinder head inverted and then pressure applied to hydraulic puller.



superintendent what to do or how to run his station. In Houston, tabs are kept on his operating record in fairness to him and the company. But Transco expects the superintendent to run the station in a businesslike manner with minimum unscheduled downtime. In other words, the company is interested in results and leaves the details to the men in the field.

To better understand how this policy pays off, shuffle through Transco's operating records in the compressor department in Houston. Every repair, every micrometer reading on rings and cylinders is on record. But the most important figures are the ones on engine availability. They run 99 percent consistently. And the annual downtime for engine overhaul—scheduled in warm weather when the demand for natural gas is lowest—runs about one day per engine, and all work is done by station maintenance and operating personnel.

The many aids which come to the individual station superintendents in the form of drawings as mentioned above concern almost every aspect of engine maintenance and overhaul. Some of the highlights of these ideas are as follows:

Gasket holders. These are made of 4 ft. by 8 ft. sheets of plyboard arranged as shown in Figure 1. They are hinged to open and close like a book, and the individual "leaves" of the "book" are supported by casters. They close and latch together against the matching shelves containing labeled bottles of miscellaneous screws. Each gaskets hook carries its designation and the proper number which should be on hand for station stock.

Gasket repair boards. These are for individual engine repairs. Simply load up the hooks with the

Gasket holders, hinged to open and close like a book, are made of 4 ft. by 8 ft. sheets of plyboard. Casters on individual panels allow holders to "roll" open.

proper number of gaskets and load the board in a truck and carry it to the compressor building. You have the exact number of gaskets on hand needed to repair a single engine.

Safety door latch. This is a clever device developed by personnel at Station 4 under the supervision of its station superintendent. The latch is sufficient to hold the door closed, even in a fairly strong wind, but in time of emergency it will open if a man runs against it.

Bearing cap lifter. Also called Dinosaur—because of its shape—the operator can poke this cap lifter into engine crankcase and lift caps right out.

Testing spark plugs at operating pressures and temperatures. This really pays off. Developed at Transco's Station 23, it checks reconditioned spark plugs for acceptability. See illustration for details.

Grinding valve seats etc. while heads are thermally and mechanically stressed. In the past, when valves were lapped into their seats, while the cylinder head was cold, the valves were found to be off several thousandths when installed in the engine. So the operators at Transco's Station 23 set out to rectify this situation. Why not, they reasoned, thermally and mechanically stress the head—under conditions identical to ordinary operations—and then grind the valves. This is exactly what they did. They devised a means of heating the cylinder head to operating temperatures and stressing it mechanically—as though the bolts were torqued up—and then the valves are ground.

These samples show how the initiative of station personnel have paved the way to greater efficiency for the company. And as more engines go on stream every year in Transco's continually expanding system, engine availability plays an increasingly important part. The way its field personnel and compressor station superintendents are developing new ideas, Transco will have few problems.

After stressing equipment for mechanical loading is installed on head, it is torqued to 9000 psi. Operating temperature of about 190° F is obtained by circulating hot water thru head to establish thermal stress. Following this, valves are ground as illustrated.



DIESEL SPECIALISTS ... AND WITH GOOD REASON

Keyed to Accredited, Dependable Service of Fuel Injection Systems and Related Equipment, Association of Diesel Specialists Continues Growth; Upcoming Semi-Annual Meeting Scheduled in Chicago

ON September 22, the Association of Diesel Specialists will start its four-day meeting and exhibit at Chicago's Hotel Sherman. This is the 10th Semi-Annual meeting of this international organization which has grown rapidly in the last five years, not only from the standpoint of membership, but also from the range of services and facilities it offers diesel engine users.

The Chicago meeting will be centered around technical, business and organization practices and policies and several widely known experts in the field of service planning and management, and engine application and operation will participate in the program. Among these is George R. Mackey, sales manager of the Dynamometer Div. of Clayton Mfg. Co. and a regular columnist in this magazine, who will talk on "Horsepower and Profits." Also on the program is Roy Larson, chief research engineer of Engineering Controls, Inc., who will present the subject, "Developments in Heavy Fuel Oil Burning on Towboats." The technical program is open to all engineering and service personnel of engine and equipment manufacturers, and op-



H. E. Wittersheim



H. B. Sirotek

erating companies with a special interest in this field, as well as service companies interested in association membership.

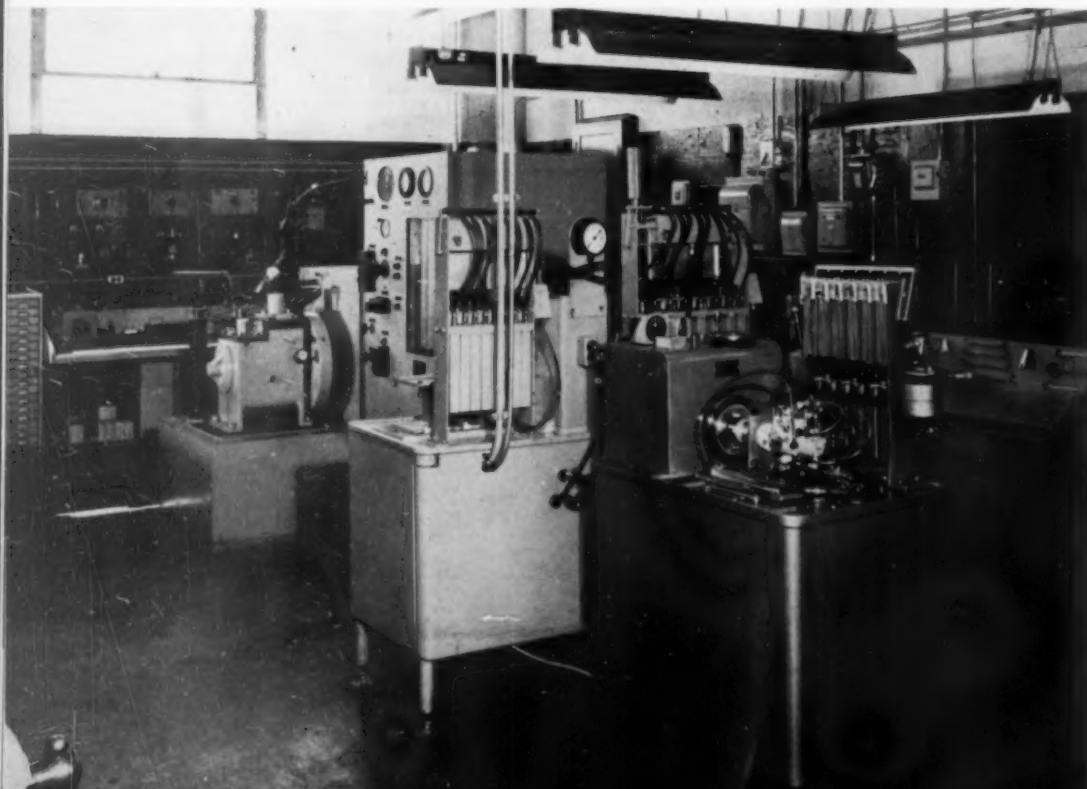
Considering the gaining importance of this association, your editors believed you would find additional information on the ADS of great interest. Since it was incorporated in March, 1957, the ADS has steadily increased in size and presently 106 firms, stretching across the States to Mexico, Canada and the Philippines are service members. They are joined by 30 manufacturing and associate members, many of which will be exhibiting at the



Chicago meeting. As an association, the ADS has many aims and objectives, principally to promote and encourage the highest standards of ethics and workmanship for the improvement of the diesel industry and the protection of its customers—to encourage and foster research and developments of procedures, equipment and material—and to provide facilities for the interchange of technical ideas and procedures, with which to better serve the users of fuel injection and related accessories and equipment. It has been estimated that more than \$4 million is invested by this service group in equipment and fuel injection parts. The illustrations on these pages are typical of the excellent service facilities which can be found in these shops around the country.

Current president of the ADS is Henry B. Sirotek of Illinois Auto Electric Co., and he was preceded by H. E. Wittersheim, Diesel Injection Sales & Service, who was president at the Association's founding. Other present officers include: M. A. Gerhardt, Gerhardt's Inc., vice-president; S. E. Franklin, Diesel Control Corp., secretary; and V. J. D'Aversa, A & D Diesel Service, treasurer. Many committees are active in the organization and one of the most important is that on Standards. Currently engaged in the development of fuel injection pump calibration standards and test procedures, the committee is working closely with the fuel injection committee of S.A.E. and the manufacturing members so that uniform, quality service is provided throughout the country. Also functioning strongly is the Service Information committee which publishes for ADS members a manual containing descriptive data, specifications, drawings, etc. on all fuel injection equipment and systems and their installation and service, plus

One section of W. J. Connell Company's facilities in Newton Upper Falls, Mass. Note layout of room to facilitate prompt, orderly repair and test work and the use of modern equipment such as the calibrating stands in the center.

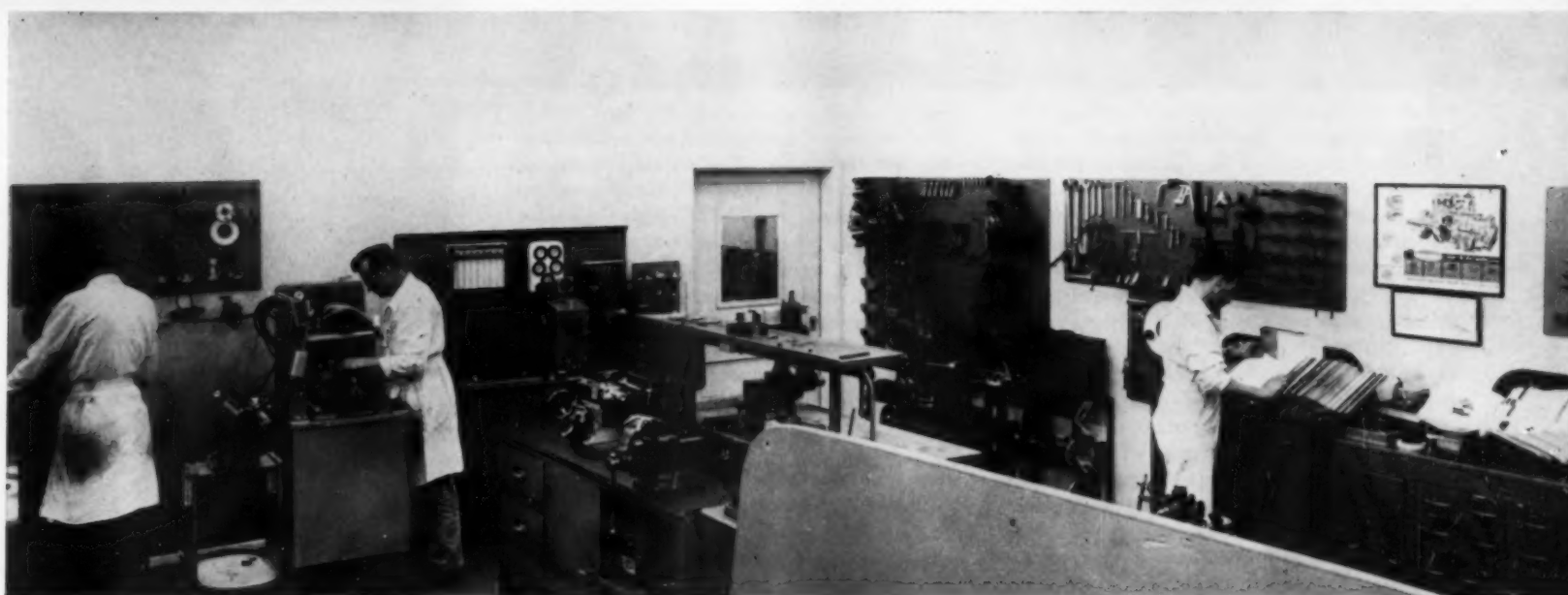




One of the newest and most completely equipped shops is that of Gerhard's Inc. in New Orleans. This view shows the 12 nozzle and injector test benches plus the facilities for nozzle reconditioning and lapping. Test equipment is built by American Bosch, Robert Bosch, Bacharach and Diesel Control. Gerhard's has own classroom for customer service instruction, large parts department, coffee shop, etc.

Efficient shop layout is shown in this view of Diesel Fuel Injection Service, Inc. in St. Louis. In the left front is the Bosch, Bendix, Adco and Demco single plunger pump calibrating stand, in the center is the multi-cylinder pump stand with the International calibrating stand directly behind it.

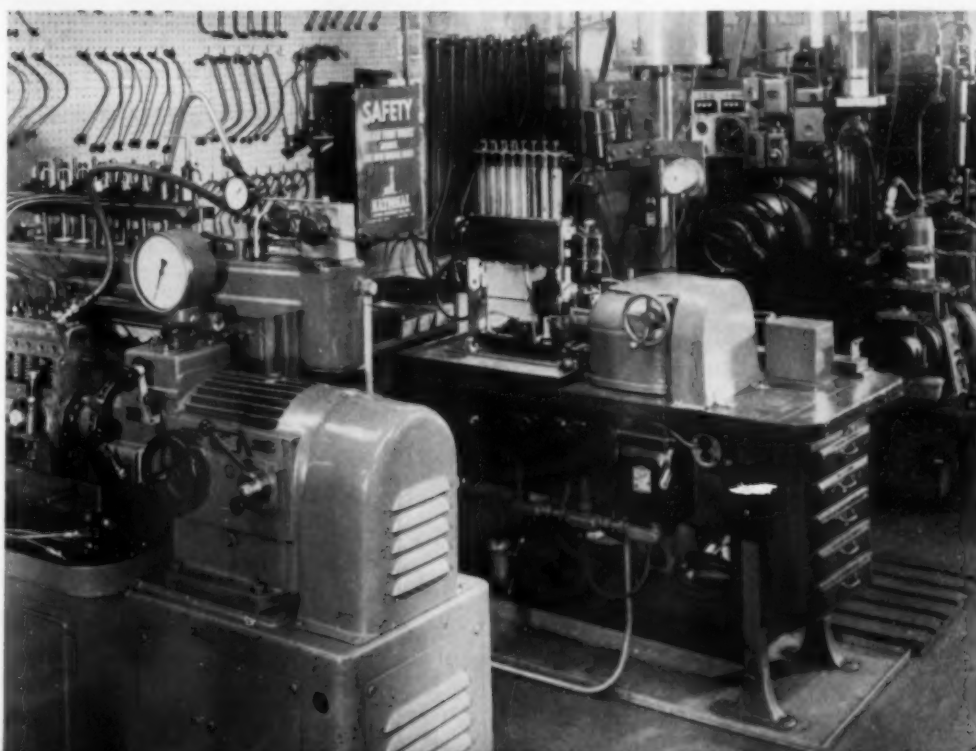
Diesel Control Corp. shop in Wilmington, Calif. has an excellent range of equipment and experienced personnel to service diesel users. Tools and equipment are arranged around edge of shop for good access to benches. As is typical of ADS facilities, shop is clean, air conditioned.



special testing equipment and its operation, tools, shop equipment generally, procedures, etc.

At the Chicago meeting, many of the fuel injection equipment manufacturers have scheduled special clinics to cover new product design, operation and service. The exhibitors to date include the following: American Bosch Div., American Bosch Arma Corp.; Bacharach Instrument Co.; C.A.V. Ltd.; Diesel Control Corp.; Diesel Injection Sales; Hartford Machine Screw Co., Roosa-Master Div.; Kiene Diesel Accessories; Petroleum Solvents Co.; Practical Mfg. Co.; Robert Bosch Corp.; Scintilla Div., Bendix Corp.; Spray Products Corp.; U. S. Aviax Corp.; Wix Corp.; and Woodward Governor Co.

In the shop of A & D Diesel Service, Inc. in Brooklyn all pump calibrating machines are centrally located which eliminates any possible confusion between governor and nozzle repair departments. Company has total of 5000 sq. ft. with 14 skilled technicians.



FERRY IN TRAILERSHIP SERVICE



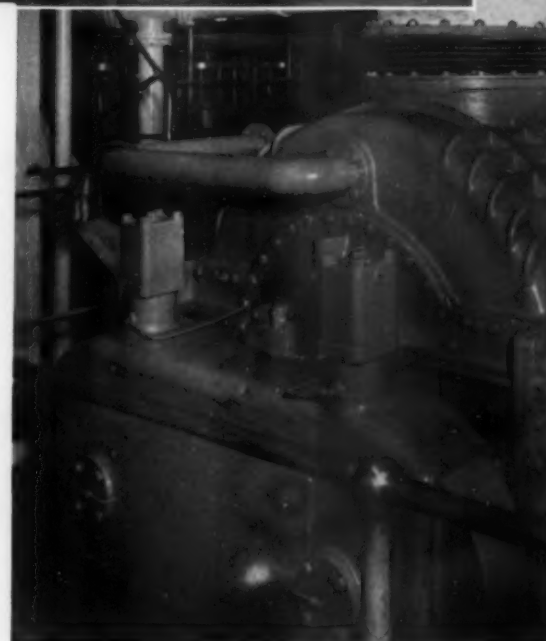
THE reorganized Detroit Atlantic Navigation Corp. of Detroit is forging ahead with plans to revive the once-flourishing common carrier traffic on the Great Lakes. Detroit Atlantic—also known as Danco—began the first phase of its program last year when it carried loaded truck trailers as deck cargo on ore ships operating between Duluth, Detroit and Cleveland.

Now the company has purchased the diesel-equipped, ice-breaking motor vessel *Vacationland* from the Michigan Highway Department and put the vessel into daily, year-round service between Detroit and Cleveland as a common carrier. The ship will carry loaded truck trailers of all types—vans and flat beds—between the two ports in a scheduled “fishy-back” operation. Idled since the 1957 opening of the Mackinac Bridge, the vessel began its Detroit-Cleveland daily service in early May, when fit-out work was completed.

The ship began its new career with a new name—the *Jack Dalton*, after C. E. (Jack) Dalton, new Danco president. The former *Vacationland* was built to navigate even under extreme mid-winter ice conditions on the Straits of Mackinac. Dalton said that ice, therefore will have no effect on the daily, year-round service the ship will provide between Detroit and Cleveland. The vessel will operate as a “fishy-back” carrier between the two ports, carrying 56 full-sized trailers on each trip. Truck tractors will load and unload the trailers at each terminal point.

The *Vacationland* was ideally fitted out for use in its present role as a common carrier without alterations of any kind. This includes engine room as well as any structural changes. To put it in daily service between Detroit and Cleveland, required only a new coat of paint and relettering of *Jack Dalton* wherever *Vacationland* had appeared.

Loading operations on the *Jack Dalton*. View shows half the trailer deck of the vessel.



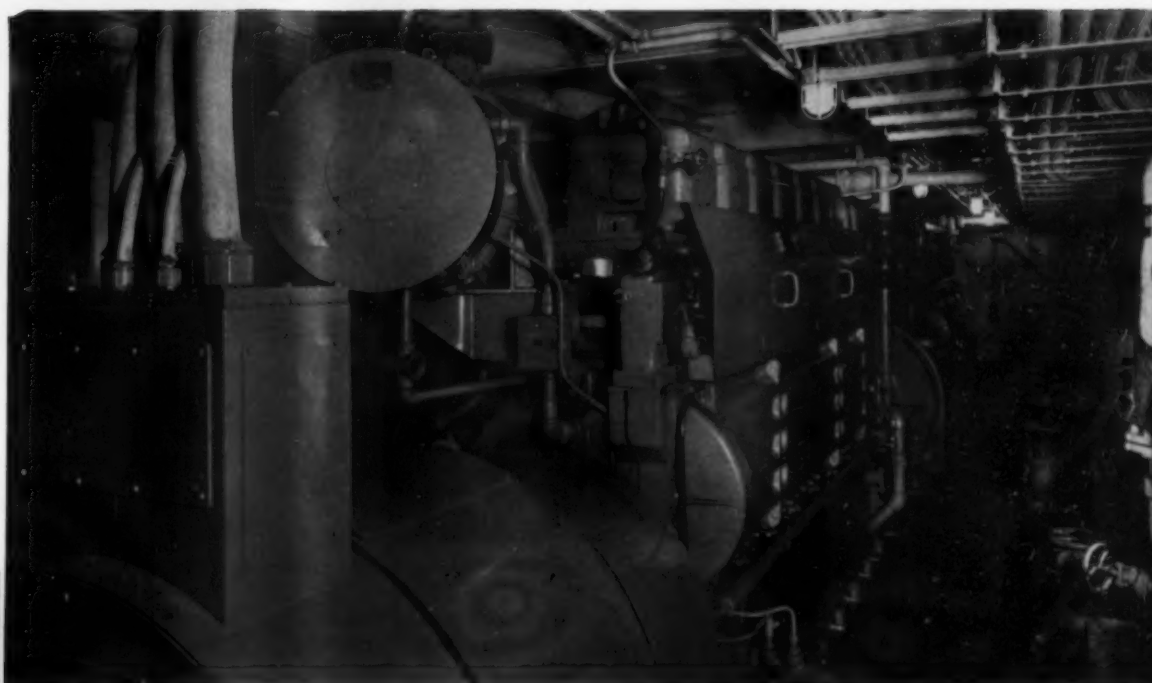
The *Jack Dalton* is powered by four 2360 hp Nordberg direct-reversing diesel engines; three 560 hp Nordberg diesel generator units supply auxiliary power. It was designed and built in 1951 by Great Lakes Engineering Works, River Rouge, Mich., and began regular ferry operation between St. Ignace and Mackinaw City in January, 1952. With an all-electric welded steel hull, the ship is 360 ft. long with a molded beam of 73 ft. 6 in. and depth to the spar deck of 43 ft. 4 in. Her hull was built especially for navigation in ice and scantlings are extra heavy in order to withstand the shock and impact of this type of operation. Normal speed is 15 mph.

The four Nordberg model TSM-218-31 two-cycle direct-reversing diesel engines propelling the *Dalton* have eight cylinders of 21½ in. bore and

◀ The *Jack Dalton* carries 56 semi-trailer vans on a regularly scheduled run between Detroit and Cleveland. The vessel formerly operated as the *Vacationland* ferry between St. Ignace and Mackinaw City, Mich.

3 Nordberg FS-97-SC diesel generating sets supply auxiliary power on the *Jack Dalton*. The turbocharged 7-cylinder, 560 hp engines drives Westinghouse 385 kw generators. Note Woodward governor.

Four Nordberg model TSM-218-31, eight cylinder engines rated 2360 bhp at 165 rpm power the *Dalton*. Each engine drives an 8-ton, 12 ft. 3 in. diameter propeller through a Westinghouse electric slip coupling.



storage for the main engines and four tanks have a capacity for 26,091 gal. of light fuel oil for the auxiliary generating engines. The entire fuel system was designed to facilitate burning residual fuels in the main Nordberg engines. Main engine fuel oil is taken from the heated bunker tanks and is heated and centrifuged and routed either to a heated clean oil bunker tank or to a heated daily service tank. Heaters are provided between these tanks and the main engine fuel headers. In the cooling water system jacket water from the auxiliary engine in use is circulated through the two main engines that are stopped. These two engines thus are kept warm and act as radiators, cooling the auxiliary engine jacket water.

Auxiliary electric power is supplied by three Nordberg diesel generating sets next to the two main propulsion engines in the forward engine room. Engines for these sets are of the model FS-97-SC four-cycle supercharged type with seven cylinders of 9 in. bore and 11½ in. stroke. Each engine is rated 560 bhp at 720 rpm and is directly connected to a Westinghouse 385 kw generator with direct-connected exciter.

Each Nordberg propulsion engine drives a three-bladed 12 ft. 3 in. diameter by 9 ft. 3 in. pitch bronze propeller through a Westinghouse electromagnetic slip coupling rated 2360 bhp at 165 rpm. Kingsbury thrust bearings are installed on the propeller shafts between the couplings and propellers. The electric couplings provided a number of operating features desirable in the ship's new role since it will be operated on Lake Erie in year-round service. They act as clutches which permit bow propellers to "windmill" when bow engines are not in use and the vessel is being propelled by the two after propellers. When the vessel is working in ice, the couplings dampen shock torques which are transmitted from propellers through line shafts to engines.

Coupling excitation is normally applied in two steps. While starting or reversing engines, reduced

excitation is applied for a short interval with corresponding reduced torque to eliminate possibility of engine stalling during such maneuvering. Full excitation comes on automatically after a predetermined time interval. Under full excitation, coupling transmits the normal load with a slip of 1.15 per cent. For dead slow operation of propellers, a second and greater reduction in excitation allows the coupling to operate at high slip for indefinite periods with very low torque transmission and low propeller speed. With propulsion engines working at 100 rpm, the propeller speed can be varied between 20 and 100 rpm.

The new carrier operation can be regarded as a refinement of the ore boat method in that the *Jack Dalton* will operate on a regular schedule and will be used entirely as a common carrier. In the case of the ore boat operation, trailer bodies were lifted off their chassis and loaded on the decks as containers. Trailers will be rolled on and off the *Jack Dalton* without removing the bodies from their chassis.

Principal Equipment Serving Nordberg Engines

Electric slip couplings	Westinghouse
Engine blowers	Roots-Connersville
Governors	Woodward
Injection pumps	Bosch
Lube oil coolers, heat exchangers	Ross
Jacket water pumps	Allis-Chalmers
Lubricators	Manzel
Starting air compressors	Gardner-Denver
Fuel, lube oil centrifuges	Sharples
Exhaust pyrometers	Alnor
Lube oil strainers	Elliott
Fuel oil filters	Nugent
Intake, exhaust mufflers	Burgess-Manning
Engine Alarms	Viking
Air filter*	Air-Maze
Fuel injection pumps*	Scintilla
Turbochargers*	Elliott
(*on auxiliary engines)	

31 in. stroke. Each engine develops 2360 bhp continuously at 165 rpm. Total installed normal shaft horsepower is 9300. This is equally divided between four propellers, two each fore and aft.

The machinery space is divided into two separate watertight engine rooms which occupy a total length of about 88 ft. in the midship portion of the ship. Because of the vessel's double ended design, the main engines are arranged in pairs, two in the after portion and two forward of the center bulkhead. It is interesting to note that although this is a double ended vessel, one end has been arbitrarily designated the bow, the other the stern.

Fuel oil is carried in bunker tanks fore and aft of the engine rooms. Seven tanks with a total capacity of 147,719 gal. provide heavy fuel oil

DIESELS ON THE JOB

**Here is Another Picture
Spread Showing Diesels Used
in Various Hard-Working
Applications Throughout
The United States**



↑
New Cleveland JS-30 trencher is equipped with International UD370 diesel engine rated 56 hp at 1250 rpm. Engine drives through a 13 in. single plate Lipe-Rollway clutch, Warner T98-A four speed transmission. Unit can dig behind either track or at any point in its 6 ft. width; automatic conveyor position permits operator to place spoil where required. Power tilting of wheel allows vertical trenching on slopes without cribbing.



◀ Caterpillar six cylinder G342 natural gas engine rated 225 hp at 1300 rpm drives a Clark Bros. model CEA2 compressor in a booster station on the W. J. Schnette lease of Texkan Oil Co. near Alice, Tex. Installed in Jan. 1960, this engine-compressor unit takes field gas of 325 psi and ups it to 900 psi, the pipe line pressure. Engine is equipped with Purolator dry type air filter and Ingersoll-Rand starting motor, Manzel compressor lubricator.

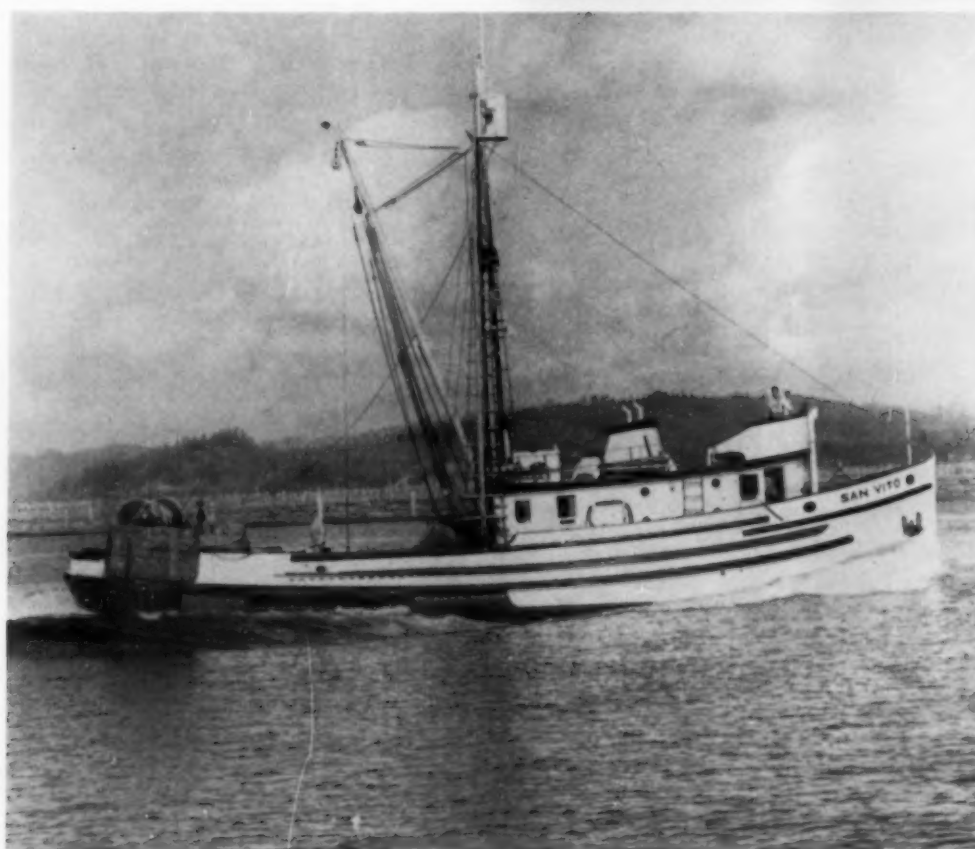
▶ Allis-Chalmers Forty-Five motor grader smooths the way for a pair of TS-260 scrapers on roadbuilding job. Smoother run for scrapers allows higher speeds, greater production. Grader is equipped with A-C model 516 diesel engine rated 127 bhp driving through Rockford clutch and Allis-Chalmers 9 speed synchro-mesh transmission. Scrapers are powered by Allis-Chalmers 16000 four cycle diesel rated 230 hp at 2000 rpm, have Lipe-Rollway single plate 17 in. clutch, Fuller RoadRanger 6 speed transmission.



New Eimco model 123 front end loader has choice of GM 4-53 or Cummins JF-6-BI diesel engines. Both are rated 100 net hp at flywheel. Unit has a working weight of 29,200 lbs., have Eimco Unidrive transmission coupled with Clark 13 in. single stage industrial torque converter "Quadra-Torque" power shift permits shifting from any of four forward to equivalent reverse speed at any engine or tractor speed or load. Model 123 has 74 in. gauge; machine has a 20,000 lb. bucket capacity at carry position and maximum breakout force of 25,000 lbs.



M/V San Vito, 78x20 ft. seiner whose home port is Eureka, Calif., was recently repowered with Cummins VT-12-M engine. Turbocharged unit is rated 400 hp at 1800 rpm, drives a 55x42 in. propeller through Twin Disc MG-521 marine gear, also drives a 20 cfm air compressor and gear box to drive deck machinery and centrifugal pump.



Herding logs into rafts for convenient towing to mill is job of this 16 ft. water bulldozer owned by Alaska Logger. Plates of 1/2 in. steel give craft battleship strength to withstand sudden impacts with heavy, water-soaked timber. Powered by GM model 4-53 diesel engine, craft is highly maneuverable.

New International compact-design tractors with Cummins NH-195 engines and 10 speed RoadRanger transmissions are inspected by F. G. Campbell, president of Campbell "66" Express, Springfield, Mo. The new tractors are rated at 61,000 lbs. gcw. Firm ordered 20 diesel tractors in this model.



PUMPING OPERATIONS ON "LE GRAND PIPE"

IF YOU want to build a pipeline in a hurry, perhaps you should begin by studying the efforts of the French in Algeria. Starting in April, 1958 and finishing 21 months later, approximately 1000 French and Algerian workers built 660 kilometers (410 mi.) of 24 in. oil pipeline from the Sahara to the Mediterranean Coast. This represents an average of 20 mi. per month, notable when one considers the three formidable obstacles to the project—the Sahara Desert, the Atlas Mountains, and the harassments of Algerian rebels.

The line is operated by Ste. Petroliere de Gerance (SOPEG) to carry crude from the large new Hassi Messaoud field to the Mediterranean port of Bougie, about 130 air miles east of Algiers. Pipe was not the only item the builders installed during the speedy schedule. The line presently has gathering facilities and a pumping station at Haoud el Hamra, near the Hassi Messaoud field; a pumping station at M'sila, along the line; and a storage and tanker loading facility at Bougie.

The first step in bringing Saharian oil to Mediterranean tankers was the hurried construction of a 6 in. line, called "Le Bebe Pipe," from the Hassi Messaoud field to a railhead at Touggourt, where the oil was shipped in tank cars to the port of Philippeville. This temporary combination was delivering approximately 6,300 bbls. per day in March, 1958 just before work started on the 24 in. line, dubbed "Le Grand Pipe." "Le Grand Pipe" started carrying 92,000 bbls. of crude per day.

Were it not for the mountains to be crossed, SOPEG would have only line resistance plus the effect of a few gentle rises to overcome in transporting the oil to the coast. However, in the northern half of the line there are two grades, one of

500 meters lift in 85 kilometers, and the other of 622 meters in 64 kilometers. The first pumping station, located at Haoud el Hamra, operates one diesel engine to push the crude up the first rise. But at the M'sila station, two engines are required to lift the oil from the station to the highest point on the line, Selatna (elevation 1,032 meters above sea level). From Selatna, the line drops to sea level in 127 kilometers.

Power for this pumping comes from Alco 16-cylinder model 251 diesel engines, two at Haoud el Hamra and three at M'sila. Each of these turbo-charged engines is rated at 2,083 cont. hp at 1000 rpm at an ambient temperature of 120 degrees F. Each drives a centrifugal pump through Falk Air-flex coupling and a gear box. One of the engines at each station is a standby. All five are of the basic 251 four stroke design with 9x10½ in. bore and stroke but because of the fuel they burn and the climate they operate in, they have certain accessories, which, in the case of the engines at Haoud el Hamra, are unusual.

The 251's at Haoud el Hamra are sheltered only by a roof, because the engines will only be located there for a short time. Being thus exposed, and using sand-laden desert air, the two diesels have definite need of special intake air filtration. This is provided in each engine by a two-stage filter—the primary stage consisting of a cyclone separator and a motor-driven sand ejector, and the secondary consisting of an oil bath filter. The arrangement is designed to remove up to 500 lbs. of sand per day from the intake air of each engine.

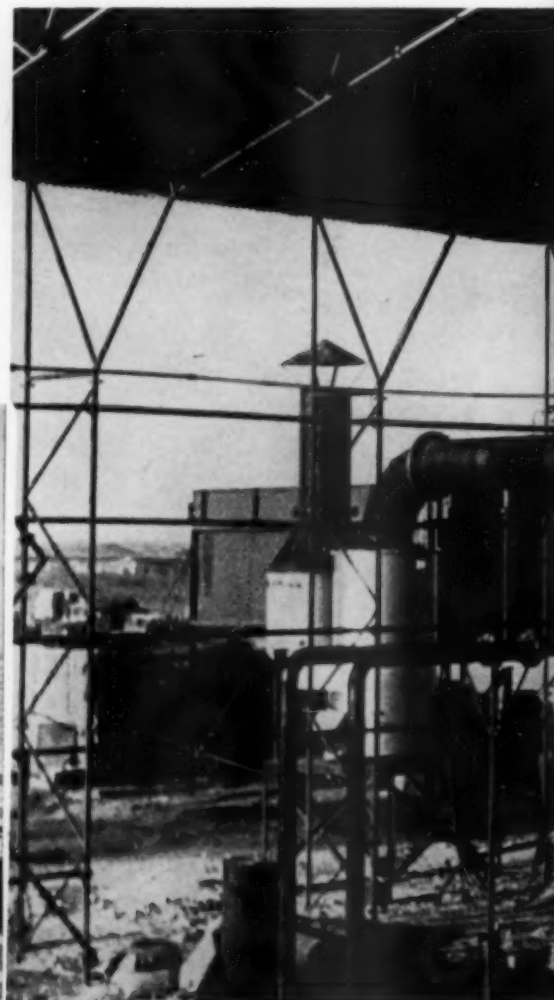
The sand ejector blows away the sand collected in the primary air filter sump so that operation can go on indefinitely without the operator having

to clean out the sump. This is necessary because the regular procedure at this station is for operating personnel to retreat to an operating enclosure during sandstorms, while the engine goes on running unattended. When a lengthy storm is over, workmen return to shovel away the sand which drifts against the engines. The two engines are scheduled to be moved to M'sila before engine maintenance work becomes necessary. In another variation in accessory equipment, Alco specified round finned tubes instead of the customary flat tubes for the engine cooling radiators. Finned tubes have more resistance to erosion under the impact of driving sands than do the standard core sections, according to Alco engineers.

A third variation in accessory equipment has been made on the 251's so that they may burn the type of crude which flows in the pipeline. In many respects, the Hassi Messaoud crude resembles a good grade 2D diesel fuel. Alco used Hassi

Alco 251, 16 cylinder, 2290 hp diesel engines at Haoud el Hamra station are sheltered only by a roof. They operate unattended even in sand storms. Special engine air filter, cap-stacked drums at left, have sand separator, oil bath filter.

A French firm built 410 mi. of pipeline from Haoud to Bougie, averaging 20 miles per month. To finish job, builders overcame Sahara climate, tough Atlas mountains. Here ditcher digs line in Sahara sand.



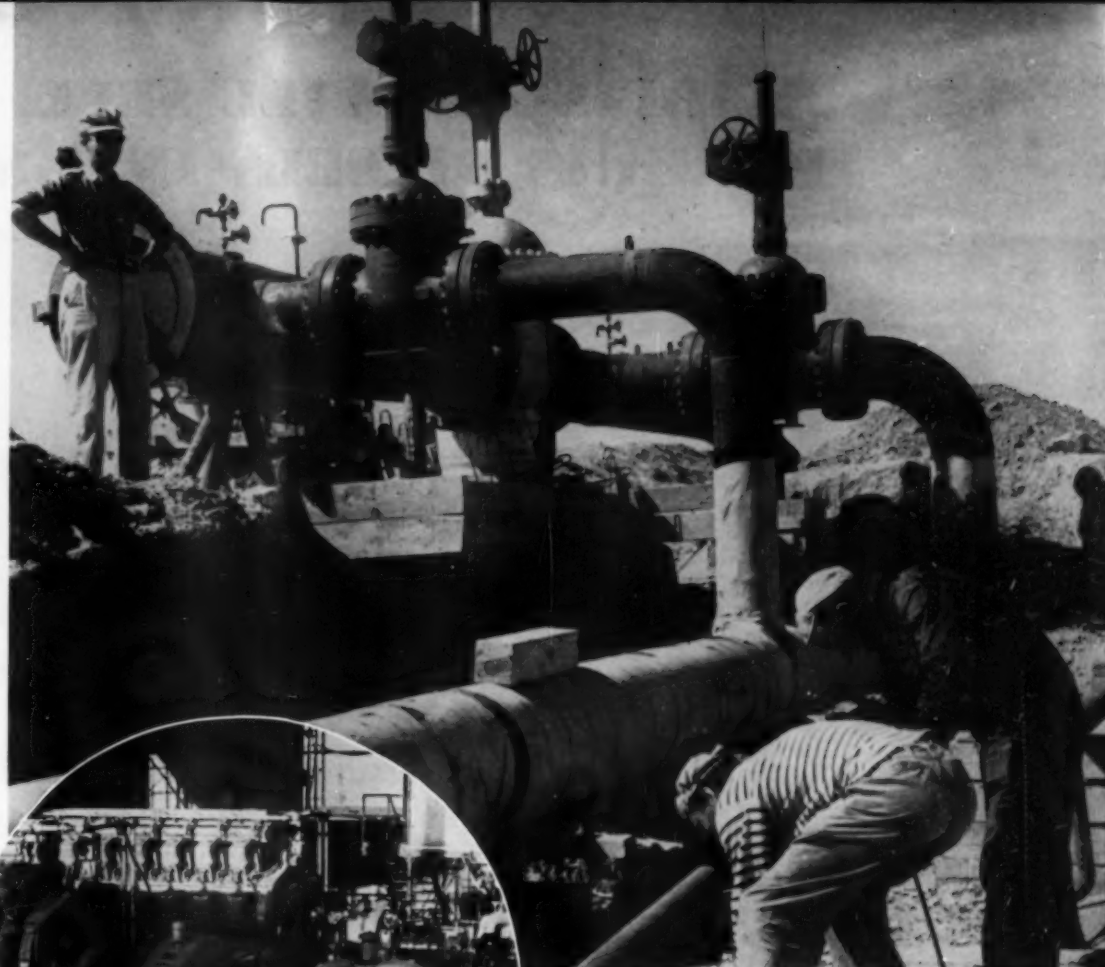
50 DIESEL AND GAS ENGINE PROGRESS

Messaoud crude for the production test runs of two of the five engines for SOPEG, and found that the distillation range initial boiling point for this fuel ran as low as 104 degrees F; flash point was below zero degrees F; and pour point was as low as -50 degrees F. These values reflect an exceedingly volatile crude, and such volatility would tend to cause "gassing" of the fuel in the supply headers and fuel pumps at elevated temperatures.

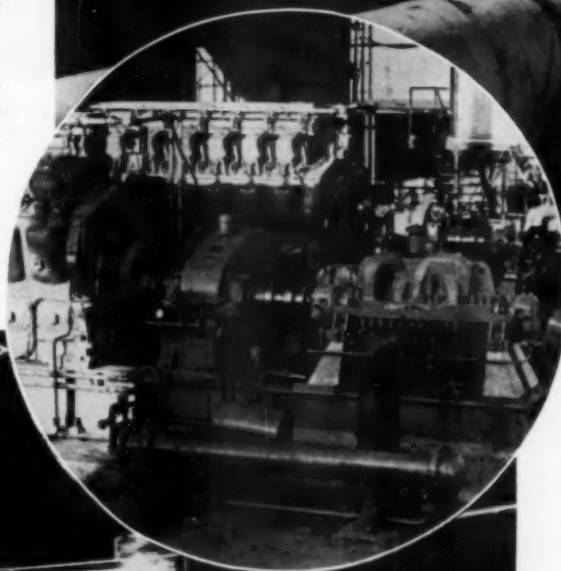
To enable each engine to develop not only rated horsepower, but the 2,290 hp specified test horsepower, Alco combatted the gassing problem by equipping the engines with insulated fuel supply and return lines, and by raising the fuel manifold pressure setting. Thus equipped, the engines developed the specified rated and test horsepower under the Saharian desert operating conditions which Alco simulated by raising the intake air and fuel oil temperatures to 120 degrees F. Besides revealing the ability of the engines to develop the horsepower, the production tests showed that the diesels consumed only 0.370 to 0.371 lb./bhp/hr. of fuel, thus promising economical operation in the pumping stations.

Engine control is of the pneumatic type. This system regulates engine speed to maintain desired main pump discharger pressure. There is a shut-

View of drive end of engine at Haoud el Hamra pumping station. Each engine drives a centrifugal pump through a Falk Airflex coupling and gear box.



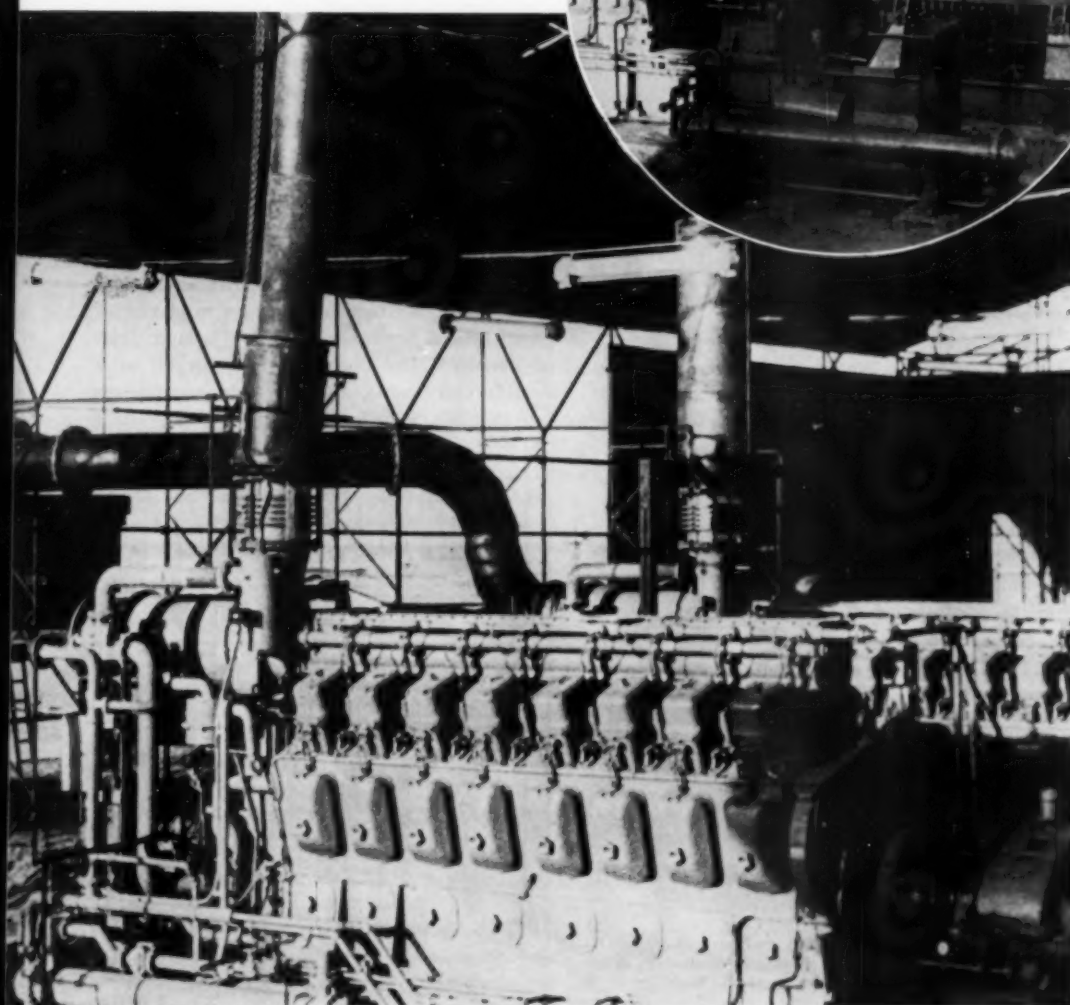
Workers install valves in the pipeline at one of the pumping stations on the Sahara line.



down feature which will shut down the engine if suction pressure drops below a preset limit. This is to prevent cavitation in the pump, which, if extreme enough, can shake a pump to pieces. These engines are equipped with an unusual number of alarms, similar to a remote, unattended engine, even though operators are on hand at all times. Each engine-gear-pump unit has alarms for the following: (engine) high water and lube oil temperature, low water and oil level, low lube oil pressure, high exhaust temperature and low control air pressure; (speed increasers) bearing lube oil low pressure and bearing lube oil high temperature, and, (main pump) bearing lube oil low pressure and high temperature, high pump casing temperature, seal leakage and casing vibration, and, (pump and speed increasers) high temperature in bearings proper.

Principal Equipment Serving "Le Grand Pipe" Pumping Stations

Main engines (5)	Alco
Air Couplings	Falk
Governors	Woodward
Cooling radiators	Young
Fuel injection pumps	American Bosch
Air starters	Ingersoll-Rand
Lube oil filters	CFC Fulflo
Lube oil strainers	Nugent
Lube oil coolers	Young
Thermostatic controls	Amot
Before-and-after lube pumps	Deming
Engine alarms	Viking
Air intake filters	American
Exhaust pyrometers	Alnor



CHRYSLER WILL SELL, SERVICE PERKINS DIESELS IN U.S., CANADA

By JIM BROWN

AS the result of an agreement between the Chrysler Corp.'s Marine and Industrial Engine Division and the Perkins Diesel Engine Co. of Peterborough, England, the Chrysler division has assumed responsibility for sales and service of Perkins marine, industrial and vehicular diesel engines in the United States and Canada.

The new diesel sales activity will be under the direction of W. L. (Bill) Pringle, President of the division and formerly president of Hercules Motors Corp.; R. M. Purdy, sales manager, who was previously with the Long Division of Borg-Warner Corp. and Sales Director W. F. (Bill) Humphrey, also previously with Hercules.

The Perkins diesel engines to be handled by Chrysler's Marine and Industrial Engine Division will include three, four and six cylinder engines in a horsepower range of from 20 to 140 bhp. The basic models are the P3/144, Three B 152, Four 99, Four 270, P4/203, Six 305 and Six 354 engines. Based on these models a wide variety of industrial, agricultural, marine and vehicular engines are available including fan-to-flywheel, base-mounted open and base-mounted hooded models; marine engines with or without reduction gears; taxi, lift truck, bus and highway truck engines to suit many requirements.

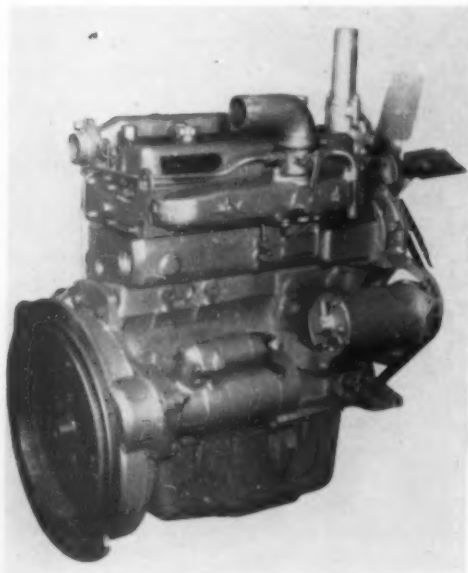
Perkins diesels are all 4-cycle engines. They are fitted with pneumatic, mechanical or hydraulic governors depending upon the application. Distributor-type fuel pumps with fuel lines leading to individual fuel nozzles for each cylinder are the rule. Some of the Perkins engines employ the Perkins combustion system with a spherical pre-combustion chamber formed in the cylinder head;



The agreement under which Chrysler Corp., Marine and Industrial Engine Division will market Perkins diesel engines in the United States and Canada is signed by W. L. Pringle (center), president; W. F. Humphrey (left), director of sales of the Chrysler Division, and J. P. Allan of F. Perkins (Canada) Ltd. The signing took place in Detroit during a meeting at which personnel from the Chrysler M&I engine center network and all Chrysler field sales engineers were introduced to the Perkins diesel line.

others use the direct injection system. The marine engines are available with direct sea cooling, keel cooling, heat exchanger cooling or (for special applications) radiator cooling. The cooling system on all of the engines is thermostatically controlled. The Perkins Diesel Engine Co. claims to be the largest diesel engine manufacturer in the world, with current production averaging 700 daily and with a goal of 800 daily in 1961. The company estimates that there are 70,000 Perkins diesels in India, 25,000 in Yugoslavia and 50,000 in the Middle East, with others in all parts of the world. Some 70 per cent of all Perkins engines are exported from Britain, and there are additional Perkins factories in France, Italy, Yugoslavia, Spain, India and Brazil.

Possible applications of Perkins diesels in this country are practically unlimited. They include, of course, the construction equipment, mining, petroleum, general industrial, agricultural, light and medium truck and marine fields. Vehicular type, P4 203C Perkins diesels have already attained considerable popularity in Chrysler-built Plymouth taxicabs in this country—well over 100 are operating in various cities from New York City to San Francisco, with 50 in the Detroit, Michigan taxi fleets alone. The engine fits easily into the Plymouth taxicab chassis and Detroit fleet owners have reported savings of approximately \$20 a week on each diesel taxicab in fuel alone, with added savings from decreased maintenance costs.

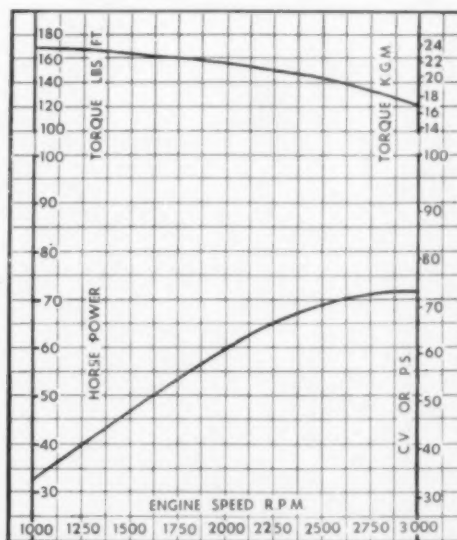


Perkins Four 203 engine for industrial applications.

Performance curves, Perkins Four 203 diesel engine. Other Perkins engines were described in our January and May issues.

Major users of Perkins diesels in this country includes Transcold, truck refrigeration manufacturer in Los Angeles. In Canada, Cockshutt tractors are also large users of Perkins diesels. As an addition to Chrysler's line of marine engines, Perkins diesels should have a natural entrance into marine pleasure craft propulsion, auxiliary and work boat applications here.

Chrysler's M&I Engine Division will distribute the Perkins engines through its existing engine centers, which currently number about 50. In addition to the engine centers, dealers and service dealers bring the total organization to about 260 points where service on Chrysler products may be obtained. The engine centers will all stock Perkins diesel parts, and the main warehousing facility will be in Detroit.



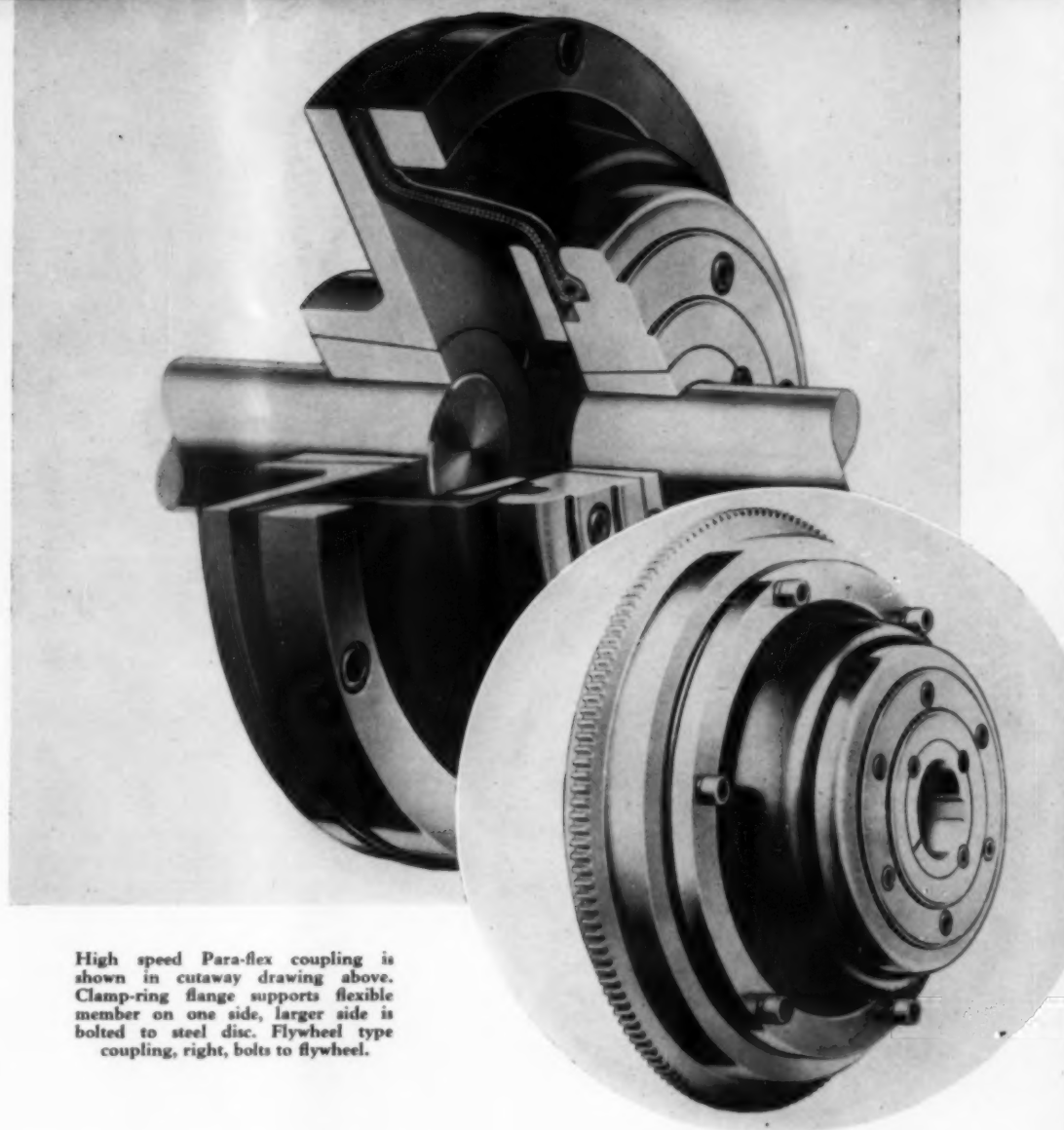
DIESEL AND GAS ENGINE PROGRESS

COUPLINGS FOR HIGHER RPM, TORQUE APPLICATIONS

A pan-shaped rubber flexing element is a feature of two new cushion type couplings being introduced for high speed or high torque applications. These new couplings are identified as Para-flex high speed and Para-flex flywheel types. They were designed to operate at higher speeds and to transmit greater torque than the original standard Para-flex with a rubber tire-shaped flexing member of cord and rubber construction announced by Dodge Manufacturing Co., in 1957.

The high speed coupling consists of the flexible member supported on one side by a clamp-ring flange and with its larger side bolted to a steel disc. Designed for speeds up to 5250 rpm, the high speed coupling may be used with electric motors or internal combustion engines to operate such equipment as hammer mills, compressors, pumps, high speed fans, marine drives, and blowers and on low-speed applications where torque requirements are high.

The flywheel type coupling bolts directly to the flywheel of an engine instead of being supported by a taper-bushed steel disc. Couplings are offered to fit bolt circles of most standard SAE flywheels to 19 1/4 in. diameter. Both types are offered in sizes to deliver up to 47 hp per 100 rpm and with taper-lock bushings for shafts to four in. in diameter.



High speed Para-flex coupling is shown in cutaway drawing above. Clamp-ring flange supports flexible member on one side, larger side is bolted to steel disc. Flywheel type coupling, right, bolts to flywheel.

COMPACT UNIT MONITORS ENGINE OR TURBINE SPEED

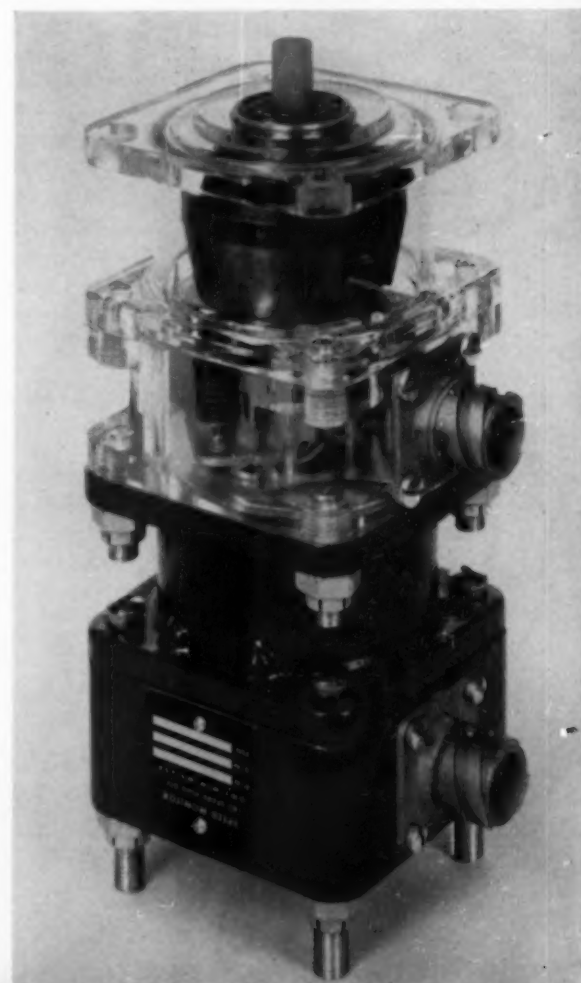
A COMPACT engine control device which detects engine speeds and, at preset limits, opens or closes snap switches to trigger specific functions is now being produced by the AC Spark Plug Division of General Motors Corp. Applications of the Speed Monitor thus far have been directed to such uses as engine starting cycle control, ignition and ignition cutoff, engine starter cutoff, clutch control, overspeed and underspeed protection, particularly in gas turbines and jet aircraft engines.

Essentially a flyball type governor, the Speed Monitor responds instantly to engine rotation and the centrifugal force of the flyballs becomes a thrust on an actuator that operates two snap action switches. The device operates within 0.5 per cent of speed setting in a range of 500 to 7000 rpm and at temperatures ranging from -65 to +400 degrees F. Maximum ratio of the higher to the lower speed is 3 to 1. Thus, if the unit is calibrated

to open or close its switches at two different speeds the higher speed setting should be not more than three times the slower speed setting.

Only 2 1/8 in. square and 2 1/4 in. high, the Speed Monitor can be mounted in any position and its setting is not affected by altitude or attitude. Where more than two switches are required or when settings are in different speed ranges, two units can be coupled in tandem, using only one pad location. Or a tachometer generator can be mounted in the same fashion. The speed range of each unit is factory set to customer specifications. The unit housing is aluminum, flyballs are of stainless steel. Total weight is one pound.

Speed Monitor can be coupled in tandem, as shown, where two speed ranges are desired. Top unit is plastic mockup to show working parts.





DIESEL SERVICE PROGRESS

A COMMENTARY BY GEORGE R. MACKAY

George R. Mackey was long associated with Detroit Diesel Engine Division of General Motors Corp., and had prior experience as a mechanic in Europe and the U.S.A., which enabled him to become well acquainted in the diesel and service fields and to obtain a broad scope of the service industry from the customer's and management's viewpoint. Further training at Carnegie Tech and in the Army Ordnance during World War II provided the necessary requirements in planning service programs. Progressive advancement in diesel service areas in General Motors and with Detroit Diesel led to his position as Supervisor of Service Promotion. Upon termination of employment with General Motors in 1952, he joined Clayton Manufacturing Company, and his present position with this organization is Sales Manager of the Dynamometer Division.

Tomorrow's Manpower

A common appeal heard in diesel service shops throughout the length and breadth of the country is: where can we find a good all round engine mechanic or service man? This is equally true in contractor or fleet shops as with distributors and dealers. Many a service manager or supervisor has asked: what has happened to all the good mechanics of the past? Sometime ago a maintenance superintendent for one of the nations large truck fleets needed five qualified mechanics to expand his service organization. He ran newspaper advertisements and received replies only from "drifters". He contacted numerous employment offices only to find no diesel mechanics registered. Upon contacting local trade and vocational schools he found that only a small number of the last few graduating groups had accepted jobs in the service industry, the others had taken jobs in automotive or aircraft factories. Even those attending high school and junior college courses in mechanics were doing so more or less as a hobby with little or no intent of making a career in mechanics. During many months of striving, this superintendent obtained three men with capabilities of becoming good mechanics, but 57 men were interviewed in the process.

Actually this problem of finding good diesel mechanics is not new, in fact it has been growing progressively worse for the past number of years. In many communities the number of diesel engines in use has increased far greater than the supply of competent mechanics to service them. Even though many manufacturers have incurred great expenses to make available specialized training on their products, there appears to be no immediate relief to the problem. Very often a distributor or dealer expects the impossible from such manufacturer's training programs by sending unqualified trainees for specialized training. These factory schools were never intended to "make mechanics", but were planned to make "specialists" out of good mechanics. When a service organization hires a man off the street and sends him to the factory, he can waste the manufacturer's time and lose the investment in salary and expenses.

There is no short cut to the acquiring of competent service personnel, and there is no use

kidding ourselves that the situation will improve. In fact there is every indication that it may become worse. With the steady growth of diesel engine population and its acceptance in many new fields, only by taking vigorous action now can the industry plan for the future and attract enough young men to the trade to meet tomorrow's service needs. Furthermore, the diesel industry is not alone in this shortage of mechanics. The automotive industry is also hard hit and is expanding every effort to overcome the problem. A number of steps have already been taken by this group—a series of suggested standards for automotive instruction, many of these have been widely accepted by vocational schools and even some high schools,—college credit for academic degrees to auto mechanic instructors who take special courses at schools sponsored by the automotive industry,—and scholarships to assist young men who enroll in college courses leading to careers as auto instructors. Many manufacturers have developed programs to assist schools and colleges in the training of auto technicians and instructors. Almost every car manufacturer makes equipment and training aids available to credited educational institutions. They have their own training centers throughout the country and many sponsor special programs designed to interest young people in the opportunities for technicians in the industry. While some of the diesel engine manufacturers are equally active, there are some who have little to offer in the specialized training of their products. Others sometimes take a complacent attitude towards the efforts of some schools who wish to offer a well rounded course of instruction on all makes of engines. The training director of one prominent manufacturer refused assistance to a large well-known trade school stating, "If there is to be any training on our engines, we will do it."

There are a number of trade schools around the country that are sincerely interested in offering a complete course of diesel instruction. Many of these are doing a creditable job, even though they may not have modern engines, equipment or training aids to do the job thoroughly. It is the responsibility of the industry to see that no stone is left unturned, or no possibility overlooked to

make complete training possible. Distributors and dealers should provide counsel with schools to be sure that the graduates they hire in the future have the proper basic knowledge and understanding to fulfill the jobs they are expected to handle. When possible, equipment, technical information and training aids should be loaned to schools. Student classes should be invited into the distributor/dealer shops for demonstration of special equipment or test equipment that is not available to them in their classrooms. Service organizations should do all within their power to assist school instructors by inviting them to attend their service meetings or special factory sponsored meetings. It may also help relieve the trained manpower situation to offer instructors jobs during their vacation periods, or offer part time employment to student mechanics. Beside this, we need more basic on-the-job training for apprentices who are unable to obtain instructions in schools. We also need many more, well organized service training programs to help the younger men in the shop obtain their full competence and to keep the older, more experienced mechanics abreast of fast changing design and developments.

Efforts should be taken to open the doors of the service industry to show the many opportunities that lay ahead, also to help create a different picture to the misconception that many have, and prove that the diesel mechanic is not a "nut buster" or "under paid grease monkey" with little opportunity for advancement. It should be made clear that the modern engine is more complex in its design and is planned for extended operation far in excess to that expected from some of the older engines, but it needs the attention of highly specialized technicians. It should also be pointed out that many who begin their careers as mechanics will have excellent opportunities for advancement to become service managers, shop foremen, parts managers, salesmen, and many others. Only when we completely analyze the trained labor shortage, set forth the proper plans to overcome the problem, and continually look for opportunities to help in the never ending job of training new men will we begin to meet the manpower needs of the service industry.

Hercules Appointments



J. G. Rongitsch

Three promotions were announced recently by Hercules Motors Corp., Canton, Ohio. J. G. Rongitsch has been appointed assistant to the president. Mr. Rongitsch served with Hercules as material controller and director of supply and inventory. Prior to coming to Hercules, Mr.



A. E. Bigelow

Rongitsch was associated for 18 years with International Harvester Corp. A. E. Bigelow, has been named Manager of Merchandising Dept. He also will supervise Service Parts Sales for the Company. Formerly a resident of Detroit, Bigelow joined Hercules several years ago. A graduate of Wittenburg College, Springfield, Ohio, he has over 25 years of experience in the fields of marketing and commerce. R. W. Newton has been appointed director of purchases. He joined Hercules in August, 1959. Newton was former sales manager of Conklin Forging Co., Detroit, and was associated with Ford Motor Co., parts operations.



R. W. Newton

New Gas Turbine Burner

Design improvements in combustion chamber burner dome and liner of the Boeing 502 series of small gas turbine engines have increased performance and efficiency, as well as enhanced capability of the turbine to utilize various types of fuels. The new burner design, now in production, was announced by the Boeing Industrial Products Division. Use of fuels ranging from diesel and jet fuels to unleaded gasoline and kerosene, without adjusting the fuel control system, is now possible with the new burner, according to the division's combustion engineers. Modifications of air inlets in the burner dome and liner, heart of the turbine's combustion chambers, also solved a cracking problem around air inlets and reduced the number of "cold spots"—areas below 1,100° F—which may generate harmful carbon deposits during combustion. More than 100 different



burner dome inserts and liners were developed and tested in the course of a continuing product improvement program. Burner dome inserts were used for economy in testing. In the photo, a Boeing combustion engineer, surrounded by some of the test patterns and types, displays the final design.

ITS NEW

Dynamometer Truck

To absorb drawbar pull of such giant vehicles as Euclid earth-moving machinery and heavy military equipment, General Motors proving grounds engineers have developed what is believed to be the biggest heavy-duty towing dynamometer truck in the world. The dynamometer unit was specially

designed and mounted on a Euclid 34-ton rear dump truck. It can exert 32,000 lbs. of restraining force continuously, and 55,000 pounds for short periods. Twenty-one average passenger cars would be needed to pull 32,000 lbs. Although it towers 12 ft. above the roadway and weighs over 92,000 lbs., power assists make it easy to maneuver. Electronic circuitry gives the operator precise automatic control of two 500 hp power absorbing brakes in the drive lines. The extra-wide truck cab with a filtered air supply is equipped with advanced measuring devices for test data, and an intercom system between the cab and the test vehicle gives the dynamometer operator "control tower" supervision of over-the-road drawbar pull or traction tests.

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5001 West Belmont Avenue, Chicago 41, Illinois
400 South Edgewood Avenue, Jacksonville, Florida
Canadian Distributors: Joseph Lucas (Canada) Ltd.
Head Office: 111 Davies Avenue, Toronto 8, Ontario
Branch Office: 3401 St. Antoine Street, Montreal 30, Quebec

AT935

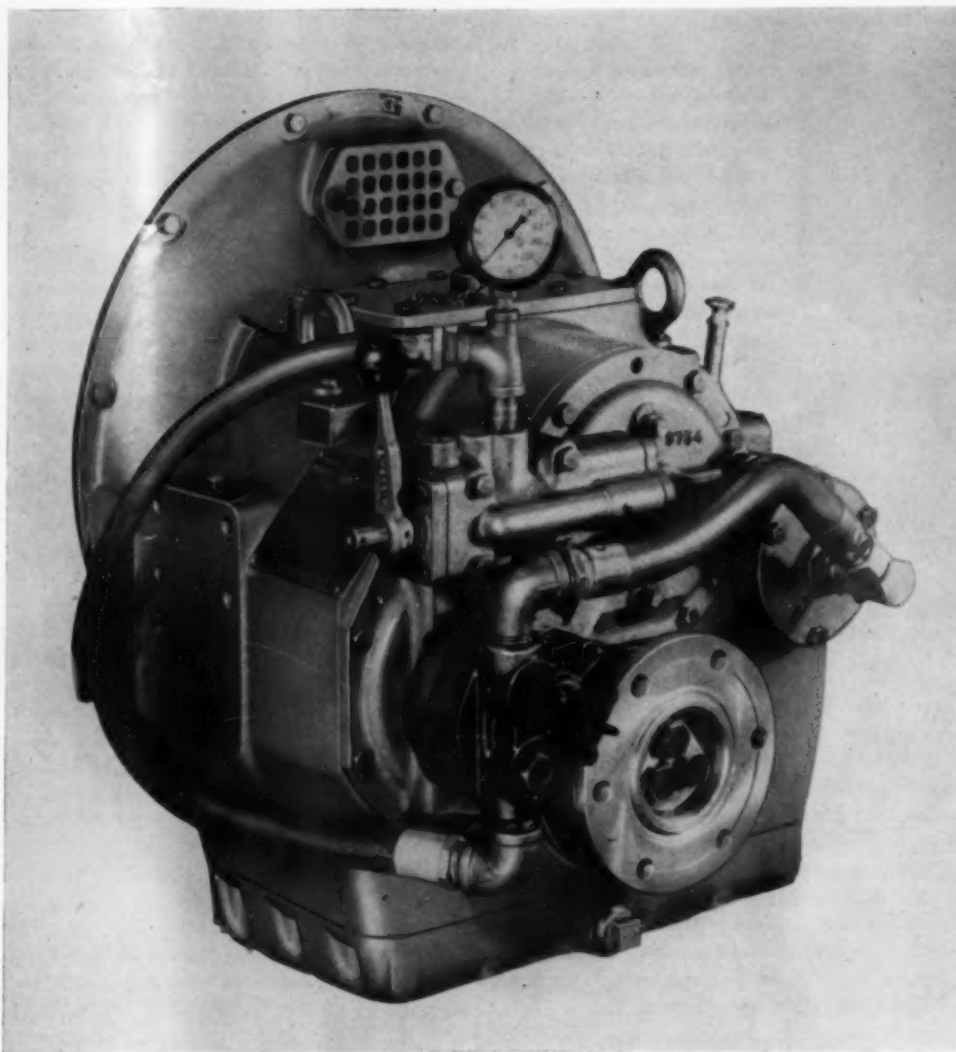
MARINE GEAR FOR MIDDLE HP RANGES

A new marine reverse-reduction gear for engines in the middle horsepower range is in production by Twin Disc Clutch Co. The new model MG-508 gear incorporates many of the features of the larger MG-512 marine gear.

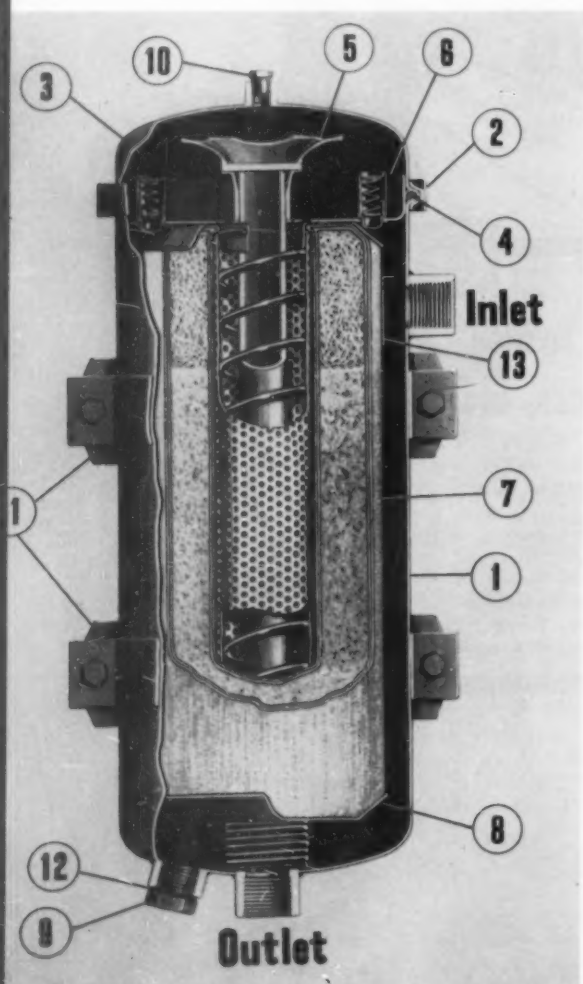
A metering selector valve actuates forward and reverse clutches hydraulically, providing smooth one-second response. Both clutches are constantly flooded with oil to carry away heat and reduce clutch wear. Full horsepower can be maintained continuously in both forward and reverse.

Helical gears are carburized, hardened and ground. They are straddle mounted on anti-friction bearings to prevent shaft deflection caused by tangential and separating gear loads. Reduction ratios available are 1.47:1, 2.04:1, 2.95:1 and 3.39:1. Three optional driving rings permit its use on many current engines as well as replacement for older Twin Disc marine gears without flywheel modification, and as replacement for the Twin Disc X-8708 war surplus gear.

Both clutches on the MG-508 can be removed for servicing without pulling the gear from the engine or disturbing alignment. An optional trolling valve permits extremely slow propeller speeds for certain fishing and maneuvering operations.



Twin Disc model MG-508 marine reverse-reduction gear.



NEW SINGLE ELEMENT FULL-FLOW FILTER

A large single element full-flow CP filter which will replace Winslow's multi-element CP filters has just been announced by Winslow Engineering and Manufacturing Co. of Oakland, California. The new full-flow CP (Controlled Pressure) filter is based on Winslow's patented principle of having two flow rates in one element. It requires only one inlet and one outlet.

This new Winslow filter, being a single-element model, reduces all cost factors. With few lines to

connect, installation time is at a minimum, as is the time for element replacement. The single element contains two filtering media—fine and superfine—encased in a double cotton cover, eliminating any danger of separation. It filters the full-flow oil stream at a flow rate of up to 25 gallons per minute of hot engine oil (S.A.E. 30) with a pressure loss of only approximately 4 psi.

Based on the patented CP principle originated by Winslow and proven by wide use in the Winslow 8-937-C filter over the past years, the new model has been released only after many months of field and laboratory testing. A simple inexpensive kit to convert present Winslow 8-937-C units to the new single-element is also available. The conversion kit will allow fleet standardization of Winslow filters now in use throughout the various diesel end-user markets.

Winslow CP filter parts description.
1 shell assembly, 2 cover coupling assembly, 3 cover assembly, 4 "O" ring (cover seal), 5 compression handle, 6 top element plate assembly, 7 CP element, 8 element carrier assembly, 9 plug—drain, 10 plug—vent, 11 mounting bracket, 12 gasket—drain and 13 oil baffle.

GENERAL  ELECTRIC

new

Tri-Clad[®] '55' Brushless A-c Generators



MOTOR STARTING CAPACITY OVER .5 HP PER KW

You get high motor-starting capacity — between .5 and 1 hp per kw — and save on installation and maintenance with General Electric's new simplified-design a-c generators. Reliable, hermetically-sealed silicon rectifiers replace all sliding contacts on this new Tri-Clad '55' line. Elimination of complex mechanical conversion equipment has cut scheduled maintenance drastically (*up to 75%*) and reduced unit weight by 50% . . . size to *two-thirds* that of previous models!

TURN PAGE FOR MORE COMPLETE INFORMATION ➡ ➡ ➡

You Save on Shipping, Installation and Maintenance with New Tri-Clad '55' Brushless A-c Generators

General Electric's new brushless a-c generators combine the proven durability of Tri-Clad '55' construction with the simplicity of brushless excitation to give you important savings in purchase cost, installation and maintenance.

Superior forcing ability of the new brushless exciter gives Tri-Clad '55' a-c generators motor starting capacity of over .5 hp per kw, 50% higher than previous equipment.

Tri-Clad '55' brushless a-c generators are available in 10-150 kw ratings at 60 cycles, single- or two-bearing

construction, and for 25, 50, 60 or 400 cycle operation. You may choose from a wide selection of engine couplings and adaptors.

For further information, contact your G-E Apparatus Sales Office or write for Bulletin GEA-6844, Section 873-01, Schenectady 5, N. Y.

SMALL AC MOTOR AND GENERATOR DEPARTMENT

GENERAL  ELECTRIC



TWIN-ENGINE EARTHMOVER IS TESTED

A MAMMOTH, 75 ton, twin-engine earthmover, designed and built by International Harvester's Construction Equipment Engineering Department went into action for the first time this spring on a midwest road-building project.

Powered by two 375-horsepower International DT-817 diesel engines, the huge earthmover is a combination of two two-wheeled tractors, joined back to back, Engineering Manager M. R. Bennett said. Designed to operate either forward or backward, it wields a 14½ ft., 8 ton dozer blade on the front unit and mounts a foot-thick pusher plate on the rear unit for pushing during scraping and loading operations. Designated the PD-105 Pusher Dozer, it's the first of its kind the company has built, although the tractors, as individual units, are already in production. An Advanced Engineering project, the vehicle is still considered experimental. The company is placing it in an actual work situation for testing purposes.

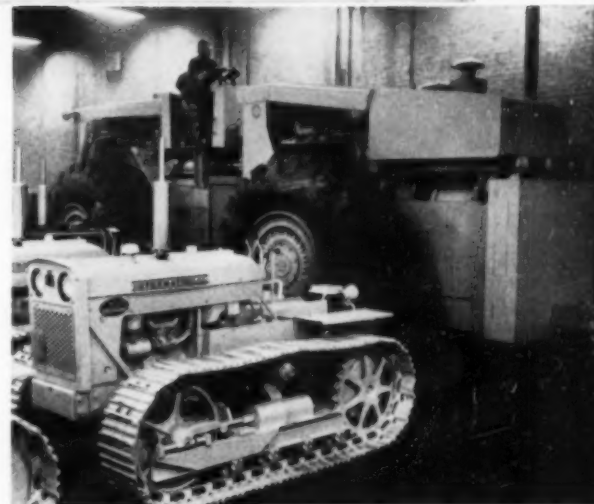
With a top speed of better than 21 mph (25 with optional high speed gearing), the unit is fast for its size, and as a pusher for other construction equipment is expected to speed up earth moving operations which today's contractors already figure in seconds, Bennett pointed out.

Pusher-Dozer bends in the middle on turns. Axles are rigid to frame side members. Hydraulic cylinders controlled from steering wheel push in opposite directions to jackknife rig. The unit is powered by a pair of International Harvester DT-817 diesel engines rated 375 hp each at 2100 rpm. Engine is equipped with Schwitzer turbocharger, Purolator air cleaners.

Moving through Harvester's Melrose Park Works en route to paint spray booth, experimental Pusher Dozer dwarfs little International T-340 tractors. With control turret reversed, operator in picture is driving the Pusher Dozer backward. Foot-thick pusher plate is used in pushing other earth-moving machines.

According to IH engineers the PD-105 can turn in the same circle with an Oldsmobile and in a smaller one than a Cadillac. Thirty feet long with blade, the Pusher Dozer's maneuverability stems, in part, from its frame steer feature. With axles rigid to frame side members, the PD-105, on turns, literally bends in the middle where the two tractor units are joined. Double acting hydraulic cylinders on either side of the vehicle push in opposite directions to jackknife the rig, which has a maximum 45-degree turning angle and can turn inside a 24 ft. radius. The PD-105 steers with a standard wheel which actuates the hydraulic steering system. Though frame steering isn't new in the industry, IH engineers believe theirs is the biggest application of it to date.

Each set of wheels in the articulated rig is powered by an 817 cu.-in., six-cylinder, turbocharged International DT-817 diesel engine, the biggest currently manufactured by the company. Together, the two engines give the PD-105 a total of 750 hp. Twin accelerators on the control turret permit



single or dual acceleration with one foot. Transmissions are single stage, torque converter driven, power shift systems, providing four speeds forward and reverse. A single lever serves both transmissions as a range selector. Another controls forward and reverse for both systems.

The Pusher Dozer's weight is well balanced between its two axles, with approximately 77,415 lbs. on the front and 72,200 lbs. on the rear, the engineers said. Under favorable traction conditions, the PD-105 can push or pull about 90,000 lbs., the equivalent of about 65 per cent of its gross weight. Among major advantages which IH engineers see in the Pusher Dozer are maneuverability through articulated power steering plus ability to push-load a scraper in either direction (which makes the PD-105 unique among vehicles of its type, power and size) and ability to push-load and doze at higher speeds offer contractors an economic advantage.

Packing Selection Chart

A packing recommendation chart, prepared by the Packing Division, Raybestos-Manhattan, Inc., shows maintenance and engineering personnel the proper packing types to choose for specific applications. This new chart, on stiff paper stock suitable for posting on the wall, suggests seven basic packing

types for 95 per cent of all packing needs. Direct inquiries to: Raybestos-Manhattan, Inc., Packing Division, Passaic, N.J.

(ITS NEW)

Expand Diesel Fleet

Texas Oklahoma Express, Inc., has expanded its over-the-road fleet with the addition of 15 International diesel trac-

tors, it was announced by Executive Vice President P. L. "Pete" Case. Cost of the truck purchase was in excess of a quarter-million dollars. The new units are International model DCOT-405 heavy-duty highway tractors. They are equipped with Cummins 220-hp diesel engines, ten-speed transmissions, 140-inch wheelbases and pusher axles with V-belt drive.

LMOA Speakers, Topics

Members of the Locomotive Maintenance Officers Association will hear an address by the association president, W. E. Lehr at the group's annual meeting opening session on September 12. The annual meeting will run to September 14. Mr. Lehr, superintendent of motive power for the Lehigh Valley Railroad, will precede F. R. Rykoskey, general superintendent of motive power and equipment for the Baltimore and Ohio, who will deliver a special address the same morning. P. F. Pfahler, assistant director of the Bureau of Safety and Service, Interstate Commerce Commission, will deliver a special address at the Sept. 13th session. Principal speaker at the association luncheon, which will honor all railroad presidents, will be P. M. Shoemaker, president of the D.L. & W. railroad. The annual meeting will also feature a series of discussions by chairmen of the association's various committees. These will include the following: *Fuel and Lube Oil*, C. A. Wilson, A.T.&S.F.; *Steam Generators and Water Treatment*, A. J. Ritter, New York Central; *Diesel Electrical Maintenance*, C. P. Stendahl, Great Northern; *Diesel Engine Maintenance*, K. Pruchnicki, T.&N.O.; *Diesel Mechanical-Other*, E. Milkert, Alton & Southern; *Shop Equipment*, S. C. Snow, Louisville & Nashville; *Diesel Material Reconditioning and Control*, L. H. Booth, Chesapeake & Ohio, and *New Developments in Motive Power Maintenance*, C. P. Turner, Lehigh Valley.

New "CX" V-Belt

Design and performance feature of R/M CX Molded V-Belts recently introduced are detailed in a new bulletin issued by Manhattan Rubber Division of Raybestos-Manhattan, Inc. A fully molded, fully jacketed notched V-Belt, this patented R/M development is made for light duty transmission drives. To date, it is available only to original equipment manufacturers. Included in the descriptive bulletin are specifications for standard and non-standard belt sizes and a condensed pre-engineered CX V-Belt drive selection table for easy reference in determining the correct belt size for electric motor drives. For copies of R/M CX V-Belt Bulletin M220, write: Manhattan Rubber Division, Raybestos-Manhattan, Inc., Passaic, N. J.

(ITS NEW)

Parker Distributors

Staver Hydraulic Co., Schenectady, N.Y., and H. U. Rogness, Inc., Minneapolis, Minn., have been appointed as regional distributors by the Parker-Hannifin Corp. Staver Hydraulics will handle Parker tube and hose fittings and Crown compressed air system units while the Minneapolis firm will handle Parker hydraulic accumulators.

ENGINEERING

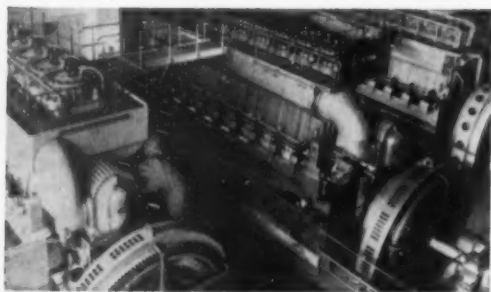
NEWS YOU CAN USE ABOUT ENGINE AND COMPRESSOR PERFORMANCE

← HAVING TOP RING TROUBLE?

THE SOLUTION MAY BE IN THE THIRD GROOVE — NOT THE FIRST!

If you've had trouble with your top piston rings (excessive groove wear, groove damage, ring breakage, etc.) you won't need to be convinced that the top ring carries from 50 to 80% of the sealing load. Installing top rings of special, expensive materials is often not the answer. They may be shock-resistant but generally lack adequate wearing qualities. One likely solution is installation of a Cooktite sealing ring in the THIRD groove to relieve the load carried by the first ring. In an engine with a compression pressure of 500 psi and a firing pressure of 1000 psi, a Cooktite ring in the third groove will reduce the pressure differential on the top ring from a trouble-causing 750 psi to an easily-handled 500 psi. Ask a C. Lee Cook representative to explain in detail.

PRESSURE DIFFERENTIAL AT FULL FIRING PRESSURE



COOK RINGS IN DIESEL SERVICE 3 YEARS—STILL GOING STRONG

Here's a report on Cook rings at Rockville Centre, N. Y. municipal power plant. It's the result of a cylinder inspection on their No. 8 diesel unit after nearly three years of continuous operation.

"While several rings were replaced in Grooves 1 and 2, Cook rings in Grooves 3, 4, 5 and 6 could run for another 10,000 hours! And cylinders averaged less than .001" maximum wear per 1000 hours of operation."

"When Should Piston Rings Be Replaced?"

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Proper planning of piston ring replacement cuts fuel and cylinder-wear costs, and prevents piston and liner damage. You can get a free copy of this informative technical study. Just write: C. Lee Cook Company, 940 South 8th St., Louisville 3, Ky.

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Regulator Bulletin

Bulletin 3300, "Fincor" Model F-33, describes voltage regulator of the tubeless magnetic-amplifier type for a-c generators or generator exciters for general use on any 60-cycle generator or exciter requiring a full-load d-c field supply of from 10 to 25 amperes at 130 volts or less. The bulletin covers advantages and uses, and includes a detailed description of operation with schematic wiring diagram, connection diagrams, and dimension diagrams. Instructions are also given for maintenance and trouble shooting. The bulletin is available from Fidelity Instrument Corp., 1000 E. Boundary Ave., York, Pa. **ITS NEW**

Western Region Manager

Diamond T Motor Truck Co. announced appointment of Lawrence R. Scholl of Oakland, Calif., as manager, Western Region. Mr. Scholl was previously vice-president in charge of sales for Peterbuilt Motors Co., with whom he had been associated for more than 20 years.

Electrical Operator Booklet

A new booklet which tells how to apply electrical operators for the remote control of circuit breakers is now available from the Westinghouse Electric Corp. The four-page publication is entitled, Westinghouse Electrical Operators. For a copy of booklet B-7534, write to Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa. **ITS NEW**

Corporate Name Notice

Illinois Testing Laboratories, Inc., 50 year old Chicago manufacturer of temperature, air, and dew point indicating and controlling instruments; power supplies; transducers and related apparatus, announce that in the future the firm will be called: Alnor Instrument Co., Division of Illinois Testing Laboratories, Inc. The new name has been adopted to convey more accurately the nature of Alnor's production.

Stewart & Stevenson Adds To Irrigation Inventory

One of the largest concentrations of irrigation inventories in Texas has been assembled in Odessa by Stewart & Stevenson Services, Inc. whose headquarters are in Houston, Tex. The company only recently completed additions to its Odessa Branch to facilitate centralization of combined irrigation warehousing and materials handling for the entire Stewart & Stevenson organization. These new facilities bring the total covered area under roof at Odessa to 21,000 sq. ft. In addition, there is an area of approximately 300,000 sq. ft. devoted to storage yard for aluminum tubing, col-

umn pipe, and other materials that make up irrigation pumps and sprinkler irrigation systems. This central supply point serves all Stewart & Stevenson branches and dealers throughout Texas and Eastern New Mexico. The irrigation headquarters, while located at the Odessa branch, are not part of that branch operation but operates as a separate undertaking. Irrigation headquarters

personnel report directly to Houston headquarters. Materials handling manager is Leo Foxworth, formerly of Houston, who has been responsible for irrigation materials inventory and handling for five years. Other key personnel include Bill McWhirter and W. B. (Bill) Collett of Houston, respectively general parts manager and sales promotion manager.

READY NOW! The completely new 1960 edition of the **DIESEL AND GAS ENGINE CATALOG**, Volume 25, can now be purchased. If you design, purchase, sell, operate or service diesel, dual fuel, or gas engines, the Catalog is essential to you and your business. This giant, 442 page, 10½ x 13½", fully illustrated reference book has been rewritten, revised and brought up to date completely from cover to cover and costs just \$10 postpaid anywhere in the world. Send checks, money orders or company orders to **DIESEL AND GAS ENGINE CATALOG**, 9110 Sunset Blvd., Los Angeles 46, Calif.

1. Michigan 85 D Loaders with A6L 514 Deutz aircooled diesel.



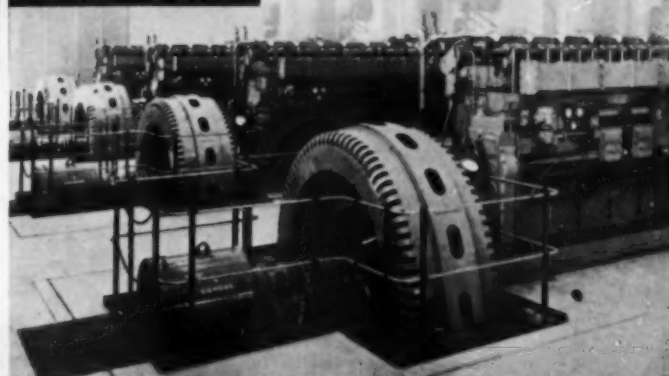
2. Brax Vibro Factor with Deutz A 21.514



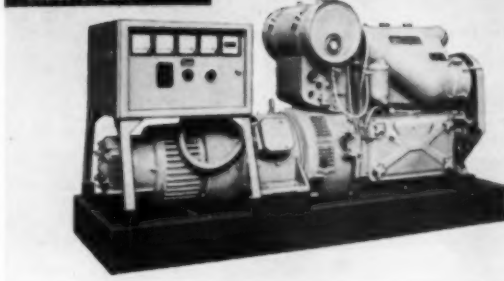
3. 2000 BHP Deutz Diesel being lifted aboard the Lindbergh



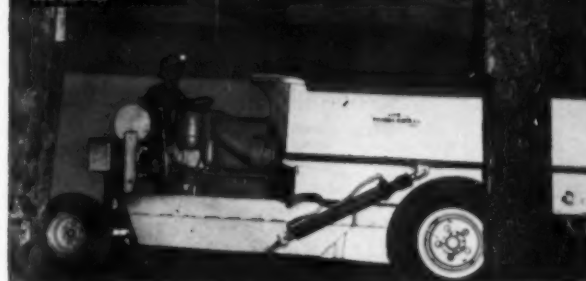
4. Deutz equipped power station at Chittagong, Pakistan



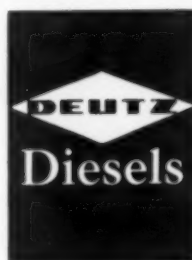
5. Generator set with Deutz Diesel A 3 L 514



6. Deutz driven Young ore carrier



Dynamic Deutz Diesels are equally at home in front-end loaders, compactors, marine vessels, power plants, generators or ore carriers. There is a wide range of both air and water-cooled diesels. Unequalled reliability, rugged construction and high economy have been Deutz trademarks for over 90 years. Any diesel application problems? Send coupon!



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Please send me information on Deutz engines available in my industry:

<input type="checkbox"/> Marine	<input type="checkbox"/> Power Equipment
<input type="checkbox"/> Mining	<input type="checkbox"/> Irrigation
<input type="checkbox"/> Construction	<input type="checkbox"/> Oil Pipe Line

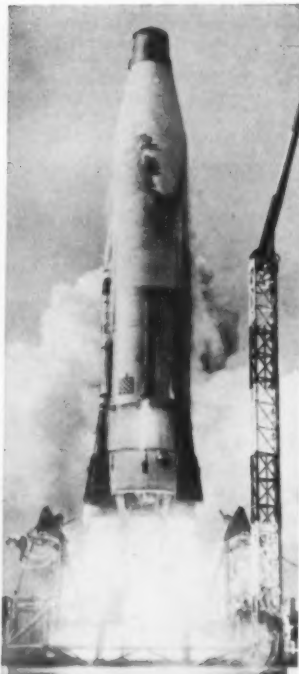
I am a ☐ dealer ☐ manufacturer ☐ operator

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Title _____

Company _____

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How VAPOR PHASE. COOLS with WASTE HEAT at ATLAS and TITAN Missile Bases

There is enormous potentiality in the waste heat emitted by engines. Vapor Phase equipment is designed to capitalize on this often-overlooked energy by converting it to practical use.

At our Atlas and Titan missile bases, for instance, Vapor Phase captures the waste heat from the exhaust and jacket water power-generating Diesels and uses it in a unique — and money-saving-way.

This heat is "processed" in Vapor Phase Steam Separators and Exhaust Heat Boilers, and incorporated into the absorption refrigeration system which cools the underground computers, radar equipment and other apparatus. Equally interesting are Vapor Phase installations at radar bases which recover engine heat to warm living quarters for the entire staff.

These are two of many, many uses for Vapor Phase cooling and heat recovery. Perhaps you are overlooking an opportunity in your own operation to turn a liability into an asset with Vapor Phase. Write today for more complete information about this remarkable system.



Vapor-Phase®
Steam Separator



Vapor-Phase® Exhaust Heat Boilers



ENGINEERING CONTROLS, Inc.

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Starting Fluid Injector



A new diesel starting device, called the Zero Start diesel starting fluid injector, has been announced. The new starting fluid injector is engineered to fit any diesel application—truck, tractor, or standby—and has a thermostatically controlled automatic shut-off making it impossible to

use once the engine reaches operating temperature. This feature, the manufacturer states, eliminates misuse and possible harm to the engine. The unit has a dashboard-mounted push-button control. An electric solenoid releases the starting fluid formula into the intake manifold. The device can be quickly installed and is adaptable to 6, 12 or 24 volt systems. For further information write Phillips Manufacturing Co., 8200 Grand Ave. South, Minneapolis 20, Minn.

44 Inch Turbine Forging

Shown during ultrasonic testing at the Westinghouse metals plant at Blairsville, Pa., this large forging of Discaloy alloy will be used in a 22,000 kw gas turbine under construction for the Philadelphia Electric Co. The gas turbine, to be used for peak shaving, will be installed as an adjunct to the utility's Barbadoes electric generating sta-



tion, near Norristown, Pa. The one-piece forging is 44 in. in diameter, 10 in. wide at its thickest section, and weighs over 5000 lbs. After these metallurgical tests are completed, the rough machined disc will be transferred to the Westinghouse industrial gas turbine department for final machining and assembly into the gas turbine. When completed, one row of 43 gas turbine blades will be mounted radially around the circumference of the disc which is designed to operate at temperatures between 1100 and 1250 degrees F. The forging is made from Discaloy—an iron base, austenitic-type high-temperature alloy.

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DIESEL AND GAS ENGINE PROGRESS

Electropneumatic Positioner



A new Electropneumatic Positioner has been developed by Mason-Neilan, division of Worthington Corp. This device is a true positioner, directly comparing valve stem position with controller output signal, achieving dynamic response and positioning accuracy. Added to

the Mason-Neilan line as model 8010, the E/P Positioner employs an extra large, stabilized, magnetic force motor to supply high force changes and a high-capacity air relay, for fast stroking speed. The electrical circuit is adaptable to all presently available electronic controllers. The relay may be mounted in any of four positions to facilitate piping, and the balanced beam permits installation of the valve in any position without shift in calibration. Stroke adjustment can be made through a plate-covered aperture without exposure of any wiring. For diesel engine application, the unit can be adapted to a pneumatic actuator positioning the throttle. Model 8010 is available for 3-15 psi or 6-30 psi valve spring ranges, or for split ranging. Standard stroke ranges are from $\frac{3}{8}$ to 3 in. and from 2 to 4 in. Other ranges can be provided. It may be used with either direct or reverse actuators. Full information may be obtained from Mason-Neilan at 51 Nahatan Street, Norwood, Mass.

ITS NEW

New Branch Manager

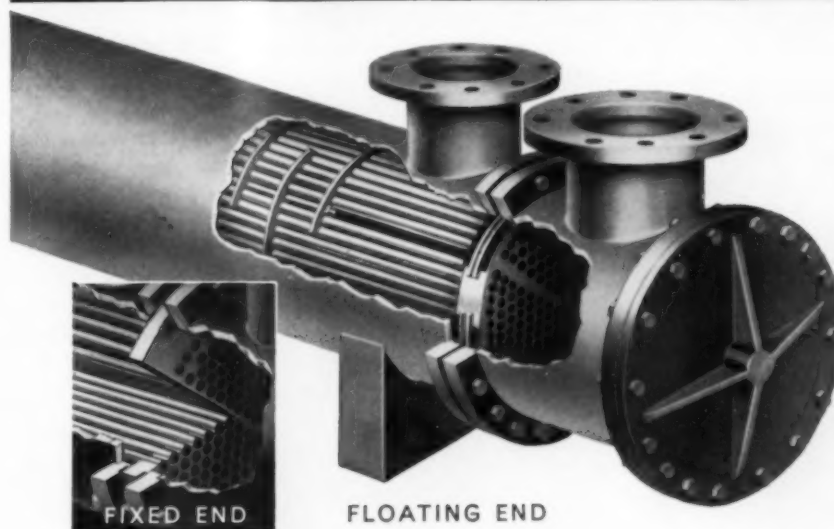


W. F. Spry

Appointment of William F. Spry to the position of West Coast branch manager for the Cleveland Diesel Engine Division of General Motors, San Francisco, Calif., was made by Horace G. Trainer, General Sales Manager of the Division. Mr. Spry succeeds Charles C. Cheevers, who

is retiring under the General Motors retirement program. Mr. Spry was born in Manchester, Mass., joined the service department of Cleveland Diesel in October 1941. In March 1943 he was transferred to the West Coast Branch as service engineer.

PERFORMANCE THAT CREATES SATISFACTION!



Yates-American
REMOVABLE BUNDLE

HEAT EXCHANGERS

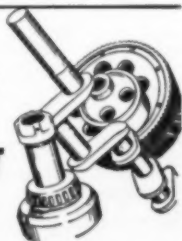
STEEL SHELL FLOATING HEAD • STRAIGHT TUBES

- Lantern gland type floating head permits free expansion and contraction and prevents mixing of fluids.
- Available with $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{3}{4}$ " O.D. bare tubes as well as $\frac{3}{8}$ " O.D. finned tubes. Diameters to 31".
- Standard materials—steel shell, admiralty tubes, alloy bolting. Special materials available to meet specific requirements.
- Ask for Bulletin HT-5.



ENGINE COOLING RADIATORS

for all wearing
surfaces where
**FREQUENT
REPLACEMENT**
is required



INSIST ON **M-C-M**

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Our customers tell us they have never
seen a better job of Hard
Chroming. We can prove it to you, too!

SEE OR CALL US NOW!



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Ph. ME 7-2449 • Oklahoma City, Okla.



Over 75 years of service to industry

HEAT TRANSFER DIVISION

Yates-American

MACHINE COMPANY
703 4th St. BELOIT, WISCONSIN

Lycoming, Deutz Sign Turbine Sales Agreement

An agreement covering sale and manufacture of Lycoming T53 and T55 gas turbine engines in Europe has been signed by Avco Corp.'s Lycoming Division, Stratford, Conn., and Klockner-Humboldt-Deutz, Cologne, West Germany. The T53 is currently in volume production in Stratford in both helicopter and turboprop versions while the more powerful T55 helicopter model is scheduled for production later this year. Deutz is the oldest manufacturer of internal combustion engines in the world, dating back to 1864. They currently produce a line of air cooled diesels ranging from 5 to 300 hp. Lycoming has been active in the turbine field since 1951 when they were awarded a military contract for development of a small helicopter engine. The T53, currently rated at 960 hp is in use by both the U. S. Air Force and Army and powers the

Bell HU-1 helicopter, Kaman H-43B helicopter and Grumman AO-1 observation aircraft. The 2200 shp T55 will power the Army's new twin turbine YHC-1B helicopter with first deliveries scheduled for later this year.

GM Distributor Expands

Anderson-O'Brien Company, GM Diesel distributor in Los Angeles, has announced the opening of a branch office in El Cajon, Calif. According to A. N. Anderson, Anderson-O'Brien general manager, the new branch has 7000 sq. ft. of service area and is equipped to provide diesel service for all types of construction, marine, and industrial equipment. Anderson-O'Brien's new branch will service Orange, Riverside, San Diego, and Imperial counties. Staffing the new office is Ed Steckline, parts manager; John Sullivan, service manager; Jack Deakins, sales representative; and Ray Banning, service representative.

De Laval Sales Engineer

The De Laval Separator Co. has appointed Wayne Patterson as sales engineer for Oklahoma, north and west Texas, it was announced by G. F. Wheelwright, Jr., industrial sales manager. He will make his headquarters at Dallas, Tex. Mr. Patterson was previously with Fairbanks, Morse & Co. selling and servicing engines, pumps, electric motors and other machinery to oil field accounts in Texas, Louisiana, and Mississippi. He will have sales responsibility for the De Laval line of industrial centrifugal separators and heat exchangers.

C-B Sales Engineer

Appointment of William F. Heavey as sales engineer for The Cooper-Bessemer Corp.'s Washington, office was announced recently. Prior to joining Cooper-Bessemer, Mr. Heavey was a manufacturer's representative in Pittsburgh, Pa. From 1937-53 he was with the U. S. Navy.

Temperature Indicating Controller

A new, electronic on-off controller and pyrometric temperature indicator is available in a single, compact instrument from the Alnor Instrument Co. Called the Pyrotroller, the unit has been designed for use on ovens, heat treating furnaces, environmental test chambers, die casting machines, injection molding machines, extrusion presses, heat sealing machines, and a multitude of processes requiring precise continuous control. The controller is available in eleven ranges from 0-400° F. to 0-3000° F., as well as an environmental test chamber range of -100 to +300° F. The new Alnor Pyrotroller is currently offered in single and double target models. Additional models will be available in the near future. For more information, write to Alnor Instrument Co., Division of Illinois Testing Laboratories, Inc., 418 N. LaSalle St., Chicago 10, Ill.

ITS NEW

Regional Managers

Appointment of William B. O'Keefe as regional manager of the Jersey region with headquarters in Jersey City, N. J., has been announced by the Industrial Division, Gould-National Batteries, Inc. Richard Relf was named as Northeastern regional manager of the Industrial Division. He will direct sales and service activities in the Northeastern states.

State Sales Manager

Al Hawyer, president of Modern Diesel Power of Florida, Inc., Tampa, announces appointment of Bert Poyner as state sales manager for their firm. A native of St. Louis, Mo., he comes to

Modern Diesel Power after serving in a sales and executive capacity for eight years in a St. Louis engine rebuilding firm. Modern Diesel Power marines the Ford line of diesel engines and is presently establishing dealerships throughout the State of Florida.

C-B Vice-President

Harold C. Johnson has been named a vice president of Cooper-Bessemer of Canada, Ltd., and will be in charge of that company's manufacturing operations. At the same time, C. W. Gilchrist has been appointed plant manager of the corporation's new manufacturing facilities at Stratford, Ontario, Canada. The announcements were jointly made by C. R. Jones, vice president and general manager of Cooper-Bessemer of Canada, Ltd., and Eugene L. Miller, president of the parent company, The Cooper-Bessemer Corporation, Mount Vernon, Ohio. Mr. Johnson was also named a vice president of the parent corporation. Until his new appointments, he was manager of manufacturing for the parent company's main plants at Mount Vernon, and Grove City, Penn. Mr. Gilchrist was formerly assistant works manager at the Mount Vernon plant. Mr. Johnson joined Cooper-Bessemer in 1946, and has held a succession of supervisory and plant executive posts. Mr. Gilchrist began his career with the company in the foundry division, and was foundry superintendent for a number of years.

In another announcement, Robert A. Woodward, formerly assistant production manager for the Mount Vernon plant of Cooper-Bessemer, was promoted to production manager of the Stratford plant. Mr. Woodward came to Cooper-Bessemer in 1950 as a production engineer in the Mount Vernon plant. He was made assistant to the Mount Vernon factory superintendent in 1952 and assistant to the Mount Vernon production manager in 1955. In 1957 he was promoted to assistant production manager.

District Office Promotions

The industrial silencer division of Burgess-Manning Co., Dallas, has announced three promotions and new assignments. Louis G. Halla has been promoted from a sales engineer to manager of the company's western district sales offices in Los Angeles. Two men were promoted in the company's southern district sales office in Dallas. H. L. Harris is the new manager, and G. R. Packer, former sales coordinator, is now a sales engineer. Albert J. Stella, Jr., joined the company as a sales engineer in the eastern district sales offices in New York City.

A few accessories that add versatility:



Automatic Advance



Electrical Shut-Off



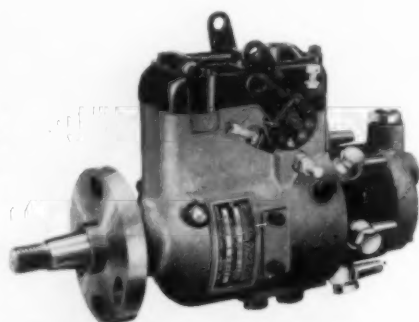
Vacuum Filter Change Indicator



Variable Speed Pump Adjustment



Hydraulic Throttle Linkage



ROOSA MASTER

Most Versatile
FUEL INJECTION PUMP

Diesel engine manufacturers, their designers and engineers are specifying ROOSA MASTER because they know that it is the most versatile. There are many reasons for selecting this pump. Here are just a few:

- **VERSATILE** because of the variety of built-in, space saving, accessories demanded by modern diesel engine design. Roosa Master can provide more compact, lower cost, complete units to meet many different applications.
- **VERSATILE** because only one size pump serves either a 2, 3, 4, 6, or 8 cylinder, 2 or 4 cycle, small or large displacement engine... and only Roosa Master can be mounted vertically or horizontally.
- **VERSATILE** because it is applicable to automotive, construction, farm, generator, marine and stationary equipment guaranteeing dependable, economical service. Write for further information.

HMS

ROOSA MASTER

makes
good
diesels
better



HARTFORD MACHINE SCREW CO., HARTFORD 2, CONN.
DIVISION OF STANDARD SCREW COMPANY

A-C District Manager

Appointment of Clare K. Tubbs as manager of industrial sales, Pittsburgh district, has been announced by Allis-Chalmers. Mr. Tubbs had been a sales representative in the Dayton district for three years and prior to that in the Detroit district for six years. He has been with Allis-Chalmers since 1949 and is a graduate electrical engineer of Michigan State College.

Assistant Manager

Norton C. Sather has been named assistant manager of American Bosch Arma Mississippi Corp., Columbus, Miss. ABAMCO is a subsidiary of American Bosch Arma Corporation. Mr. Sather, before his new assignment, was manager of Ensign Carburetor Co., Fullerton, Calif., an American Bosch Arma subsidiary now being consolidated with American Bosch Division, Springfield, Mass.

GMC Promotions

Appointment of Donald J. LaBelle as assistant chief engineer of the GMC Truck & Coach Division was announced by Calvin J. Werner, vice president of General Motors and general manager of the Division. LaBelle, formerly truck engineer in the Engineering Department, succeeds Sheldon G. Little who was named director of the newly-created product reliability department for GMC Truck & Coach. Robert E. Field, formerly administrative engineer, succeeds LaBelle as truck engineer while Harold N. Steinbaugh, formerly general supervisor of budgets and planning for the Engineering Department, becomes administrative engineer.

Diamond T District Manager

Garth G. Collins has joined the Diamond T Motor Truck Company as district sales manager. His territory consists of southeastern New York, Long Island and most of New Jersey. He replaces Harvie H. Strawn, who is now manager of Diamond T's factory branch in New York City.

Torque Converter Folder

Clark Equipment Company has issued a folder describing its Automotive Division's new air-cooled torque converter. Intended for such applications as small road rollers and construction machines, farm tractors and agricultural equipment, other vehicles and industrial power transmission, the torque converter has a nine-inch wheel and is rated at 80 lb. ft. torque input. It is suitable for use with engines in the 10 to 50 hp class without requiring special cooling accessories. Specifications in the new folder include a typical perform-

ance curve, dimensioned exterior drawings and a cutaway section. Copies of the folder can be obtained by requesting Form N1-9 from Clark Equipment Company, Automotive Division, Jackson, Mich.

ITS NEW

Clutch, Brake Idea Book

A comprehensive catalog on air-tube disc clutches and brakes has just been printed by Wichita Clutch Co. The colorful 32 page catalog contains complete specification data and many pages of photographs covering all types of applications. Also included are suggested clutch and brake arrangements to help in design or unusual applications. Copies can be obtained by writing Wichita Clutch Co., Wichita Falls, Tex.

ITS NEW

Sales Representative

Appointment of Gilbert Nelligan as a new sales representative for the Young Radiator Co., Racine, Wis. has been announced by the company's Heating, Cooling and Air Conditioning Division. Mr. Nelligan has had 23 years of sales engineering and sales management experience with the Fitzgibbons Boiler Co. In his new position he will promote Young heating, cooling and air conditioning sales in the St. Petersburg, Fla., area.

Condec Sales Manager

Frank M. Cesario has been named general sales manager of Consolidated Diesel Electric Corp.'s power equipment division by Julian Licht, the division's general manager. In his new position, Cesario, formerly assistant sales manager, will be responsible for all activities leading to the sale of the Condec line of engine-driven electrical generating equipment. Cesario joined the Condec organization in 1955. Previously he was works manager for the A. G. Schoonmaker Company, Inc., in Chester, Pennsylvania.

Orders 100 Tractors

McLean Trucking Co. of Winston-Salem, N. C., has ordered 100 GMC diesel highway tractors, it has been announced by R. C. Woodhouse, general truck sales manager for GMC Truck & Coach Division. The cab-over-engine model DF7009s, half of which have sleeper cabs, will join 295 other GMC diesel tractors placed into service by McLean over the past two years. Powered by GMC's 6V-71 diesel engine developing 210 hp, each unit also features a lightweight aluminum cab and has a gross combination weight rating of 60,000 pounds. Bumper-to-back-of-cab dimensions are 48 in. in the deluxe cabs and 72 in. in the sleeper models. McLean's present over-the-road fleet consists principally of GMC DF862 sleeper diesels.

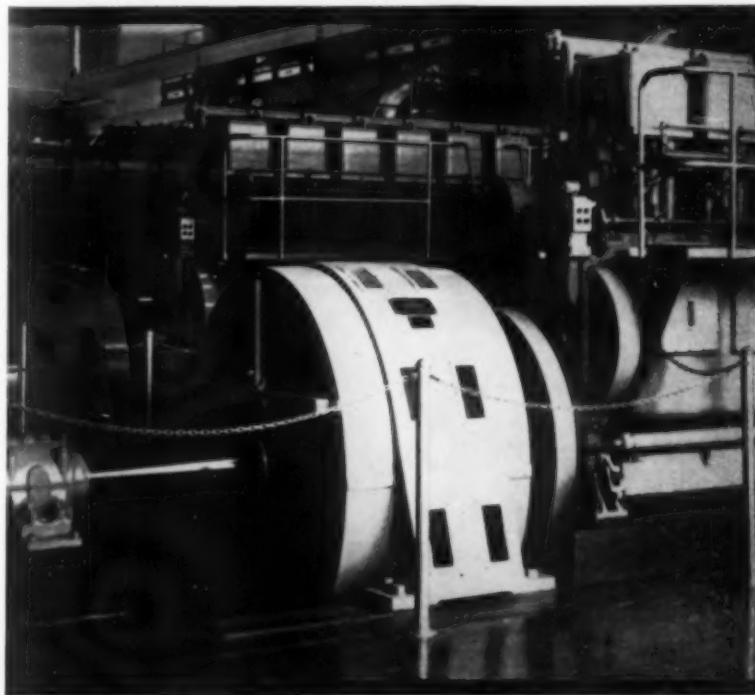
New Tube Cutters

Two new tube cutters are now included in the line of Parker tube fabricating equipment. Both are adjustable cutting tools for producing clean, square ends on steel tubing as well as on the softer copper, brass and aluminum tubing. The "Kloskut" model 216S, for tubing sizes ranging from 1/8 through 1 in. outside

diameter, has rollers specially designed to permit cutting off flared ends of tubing close to the flare. The large model 1232 cutter is for tubing sizes of 3/4 through 2 inches outside diameter. Descriptive catalog sheet 4394A5 is available from Parker Fittings & Hose Division, Parker-Hannifin Corp., 17325 Euclid Avenue, Cleveland 12, Ohio.

ITS NEW

ideal location for IDEAL dependability



Six IDEAL 956 kw, 1195 kva, 60-cycle, 3-phase alternators, with V-belted 15 kw exciters, each driven by a 4-cycle, 8-cylinder turbocharged Nordberg diesel engine, provide an unfailing power source at Vandenberg AFB in California—the free world's first operational and training ICBM and IRBM base.

Operated in pairs on an alternating 36 to 48-hour basis, these units supply uncompromising power for uninterrupted operation of the Atlas complex and will serve in missile launching in an emergency with ample reserve capacity well beyond anticipated power requirements.

Over the initial 8-months of operations, the generating plant, which is rated at a total capacity of 8,064 hp and 5736 kw, produced 4,200,000 kw/hrs. By mid-1960, the load virtually doubled as additional facilities were completed. Besides its primary mission in Atlas operations, the present installation will ultimately furnish electric power to three additional complexes on the base, slated for completion later in the year.

Write for Bulletin 510 or contact your Ideal representative



The
IDEAL ELECTRIC
& MANUFACTURING COMPANY
346 East First Street
Mansfield, Ohio

SINCE 1905, MANUFACTURERS OF PRECISION MOTORS, GENERATORS,
ELECTRIC EQUIPMENT, SWITCHGEAR AND CONTROLS

Senior Sales Engineer

Sune V. Malmgren has been named senior sales engineer in charge of sales and application engineering for the sewage treatment field, it was announced by officials of Sutorbilt Corp., manufacturer of rotary positive blowers, gas and vacuum pumps. In his new position, Mr. Malmgren will handle all requests for

technical information, quotations and similar related matters concerning Sutorbilt's sewage treatment equipment.

Solar Marketing Division

Creation of a new marketing division headed by Lynn D. Richardson, vice president-sales, was announced by Solar Aircraft Co. Fred S. Hage, Jr., formerly assistant to the president and director

of advertising and public relations, has been promoted to the position of director of marketing. Mr. Hage will supervise the activities of the marketing division, including sales, contract administration, advertising, sales promotion and market planning and research. R. Sherman Platt, secretary of the company, has assumed responsibility for corporate public relations.

Prime Mover Control Conference Set by Firm

The 24th annual Prime Mover Control Conference of the Woodward Governor Co., will be held at the firm's plant at Rockford, Ill., from Sept. 6th through 9th. The conference will include two four day sessions, one covering engineering aspects of governing prime movers, the other installation, operation and maintenance of governors for diesel and gas engines and other prime movers. In addition there will be a two day session on Sept. 6th and 7th covering airplane propeller governors. Full information on the conference can be obtained by writing the company.

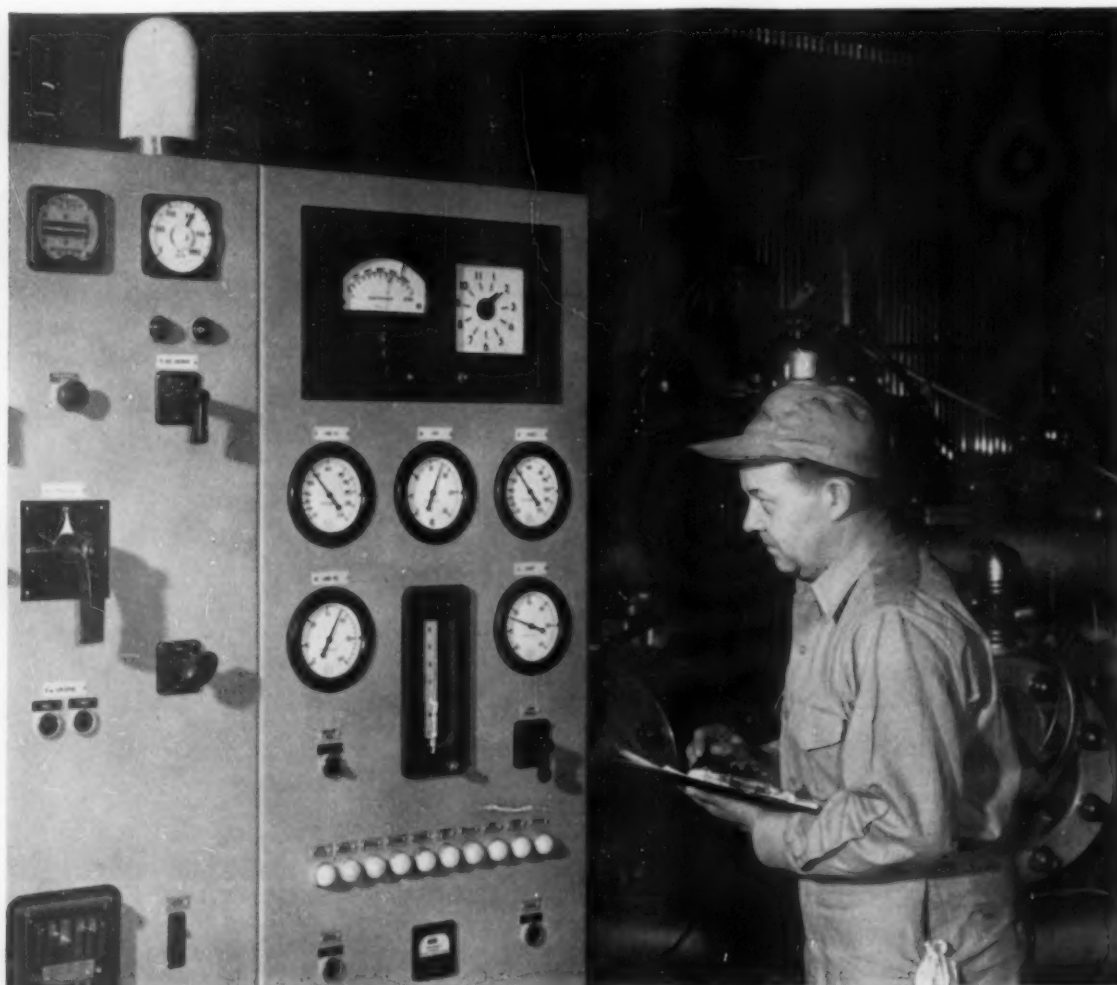
Griffin Corp. Promotions

David H. Griffin has been elected president of the Griffin Corporations, comprising Griffin Equipment Corporation and Griffin Wellpoint Corporation, all of New York City. He is succeeding the late Hugh J. Hush. James S. McConville, who has been elected vice president and general manager of Griffin Equipment Corp., was formerly vice president in charge of sales. This company is the New York and New Jersey distributor for Detroit Diesel Engines, Allison Torque-matic transmissions and Delco products, divisions of General Motors Corporation. Headquarters are in the Bronx with additional plant facilities at Lodi, New Jersey.

Diamond T Promotion

Diamond T Motor Truck Co. has announced the promotion of Roy A. Decker to director of the company's sales engineering department. Mr. Decker's new responsibilities are largely administrative and technical. His department performs market research functions, analysis of vehicle requirements and applications, and develops specifications to match truck to job for the lowest cost. In addition, he directs the training of Diamond T sales personnel, and also conducts sales engineering training meetings. These gatherings are held in major cities throughout the country at frequent intervals. A twenty-year veteran with Diamond T, Decker was formerly Assistant Manager of the company's Technical Division. As such, he specialized in service engineering, with emphasis on maintenance practices.

READY NOW! The completely new 1960 edition of the **DIESEL AND GAS ENGINE CATALOG**, Volume 25, can now be purchased. If you design, purchase, sell, operate or service diesel, dual fuel, or gas engines, the Catalog is essential to you and your business. This giant, 442 page, 10½ x 13½", fully illustrated reference book has been rewritten, revised and brought up to date completely from cover to cover and costs just \$10 postpaid anywhere in the world. Send checks, money orders or company orders to **DIESEL AND GAS ENGINE CATALOG**, 9110 Sunset Blvd., Los Angeles 46, Calif.



Diesel Protection Assured with the *Alnor* Pyrotac®

A continuous check on the operating efficiency of each cylinder in a diesel engine is indicated on the Alnor Pyrotac.

Improper injection, blow by, stuck rings, failure of cooling, overload, or other malfunctioning of the engine is immediately registered by the individual exhaust thermocouples and is indicated on the dial of the Pyrotac. When the instrument is set for the normal exhaust temperature range, any variation up or down shows up immediately on the Pyrotac

dial and an alarm signal informs the operator.

The motor driven switch unit of the Pyrotac monitors the exhaust temperatures of each cylinder continuously, thus any trouble in an individual cylinder can be spotted immediately.

Alnor Pyrotac models are available up to 20 circuits. Manually operated pyrometric indicators are sufficient in some installations.

Most diesel power plants operating today are Alnor equipped. Write for bulletin 4703.



ALNOR INSTRUMENT CO.

Division of Illinois Testing Laboratories, Inc.

Room 508 • 420 North La Salle Street • Chicago 10, Illinois

Promoted at A-C

Appointment of G. A. Saar as general manager, mechanical departments, and of W. M. Terry, Jr., as general manager, electrical departments, has been announced by Allis-Chalmers Industrial Equipment Division. Saar, who had been assistant general manager of the Industrial Equipment Division, is now responsible for operations of the processing machinery, compressor and West Allis pump departments. Terry, director of engineering coordination for Allis-Chalmers Industries Group since 1957, is now responsible for the operations of Norwood (Ohio) Works, including the electrical and pump departments there, and the control and industrial systems departments, and the rectifier section at the West Allis Works. Prior to his appointment early this year, as assistant general manager of the Industrial Equipment Division, Saar was assistant to the senior vice-president and before that manager of the Norwood (Ohio) Works electrical department.

Mobile Training Units

A new fleet of six mobile diesel service training units designed to train mechanics in the maintenance and servicing of GMC diesel trucks and highway tractors is scheduled to be touring the nation soon. The first of the mobile schools, equipped with the latest types of diesel engines and training equipment, already are in service. The training units are driven cross-country to GM Training Centers where GMC Truck Diesel service training classes for mechanics are set up. Each is a self-contained training unit, with all the engines, components, tools, and classroom aids necessary for an instructor to teach a full one-week course. Equipment carried in the unit, which is powered by a GMC 6V-71 engine, includes a 6V-71 engine, a 4-71 engine, a 3-71 cut-away engine, blowers, governors, cutaway cylinder heads, hydraulic fans, cooling system components, fuel system components, air cleaners, cylinder liners and pistons, and other parts.

Dayton Dallas Manager

Gene L. Kirby has been named district sales manager for Dayton Industrial Products Company, handling the company's industrial line of V-Belts and sheaves in the Dallas, Tex., region.

Sales Staff Changes

Six organizational changes have been announced by Victor E. Rennix, general sales manager of Electro-Motive Division of General Motors, La Grange, Ill. In the Eastern region, Duane O. Brooks, Bruce C. Burdick and Melvin A. Hiter have been named parts sales representatives. Allan A. Michels has been appointed regional service man-

ager replacing W. A. Turner, who has retired. Burdick, Hiter and Michels will be located in New York; Brooks at Jacksonville, Florida. In the Chicago region, Henry M. Garvey has been named parts sales representative located in Chicago; and Ivan E. Rice will be parts sales representative in the San Francisco region with headquarters at San Francisco.

Engine and Tracer Lathe

A new, medium duty engine and tracer lathe is being introduced by The American Tool Works Co. The Maxi-Swing lathe has been designed to handle heavy work, up to forty tons and will make precision cuts to 3/4-inch depth. It is available in four sizes with swings from 74 to 108 inches over the bed. The bed is

56 in. wide with four hardened and ground replaceable Vee-ways. The machine is designed for use in steel mill maintenance, shipbuilding and repair, missile and similar types of work in the heavy industries. For information write for Bulletin No. 1001, The American Tool Works Co., Pearl St. at Eggleston Ave., Cincinnati 2, Ohio.

ITS NEW

PROVIDENCE HOSPITAL, Seattle, Wash., installing Waukesha Diesel Enginator, 350 KW stand-by unit.



All Set!

This Seattle hospital is *all set* for a power failure emergency. Picture shows a big 11-ton Waukesha Enginator going into the power house basement. Automatically and immediately the necessary electric service is provided by this Diesel-fueled Waukesha Enginator. It's a Model LRDBCSU packaged unit, including all control equipment—350 KW, 120/208 volt, 60-cycle, 3-phase, 1200 rpm.

Everywhere large and small institutions are making their facilities as emergency-proof as possible, with the help of Waukesha Enginators. Backed by over 50 years of building heavy-duty engines and electrical equipment, Waukesha Enginators (engine-generator combinations) have a world-wide record of proven reliability. Diesel and carburetor fuel models ... all standard AC voltages ... up to 800 KW. Send for literature.

For Continuous, Intermittent,
and Emergency Service

AUTOMATIC
IMMEDIATE

electric

SERVICE

for—schools ... hospitals ... office buildings
... utilities ... ships

... industry ... and
wherever uninterrupted
electric service is essential.

WAUKESHA ENGINATOR

Special Products Division

WAUKESHA MOTOR COMPANY, Waukesha, Wis., New York, Tulsa, Los Angeles

Crankshafts Reconditioned While In The Engine

A new folder describing how industrial crankshafts can be ground and honed while in place has been published by Golten Marine Co., Inc. The brochure describes how all work, including grinding, honing, lapping, polishing and reconditioning, can be completed in your plant without dismantling the engine. Service men employing Golten patented, portable equipment can begin work wherever required within 24 hours. According to Golten, a job that normally might take many weeks if the crankshaft had to be removed can now be completed in a matter of days with resultant savings of time and money. Golten has completed many thousands of these units with crankpins and journals fully guaranteed to be concentric with original centers, true round and parallel within the most rigid specifications. While journals and/or pins are being reground, bearings are usually air shipped to their nearest plant for re-babbitting by the recognized Golten centrifugal babbitting method and machined to suit new shaft conditions. Three different type crankshafts, each with a chart to list exact measurements are illustrated in the folder. This facilitates the speed-up of a reconditioning job by permitting Golten service men to prepare in advance the attachment to suit your particular crankshaft. Copies may be obtained by writing Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn 31, N.Y.

ITS NEW

New GM Diesel Dealers

Continuous 24 hour a day road service for truckers is now offered by Tri-State Engine Services, Inc., Harry W. Livengood, vice president and general manager, announced. Tri-State, of Cincinnati, is a new company formed to handle GM Diesel's line of automotive, industrial, and marine models. President and treasurer of the new company is Robert H. Grantham. Other officers include Harry W. Livengood, vice president and general manager; Frank R. Paprich, sales manager; Walter I. Butler, general service and parts manager; and Henry H. Hofer, Jr., parts manager.

Cole Orders 50 GMC's

Fifty new GMC diesel highway tractors with all-aluminum sleeper cabs have been ordered by Jack Cole Company of Birmingham, Ala., it was announced by R. C. Woodhouse, general truck sales manager for GMC Truck and Coach Division. The model DFR8009s with 61,100 lb. gross combination weights will join an all-GMC diesel fleet of 140 over-the-road tractors now hauling dry freight to distribution points in nine states.

One of the South's biggest trucking firms, Jack Cole Co. maintains terminals in 20 cities in the South, East and Midwest. The new diesels feature independently suspended front wheels with constant-height stabilized air ride systems and aluminum tilt-cabs that are only 72 inches long. They are powered by GM 6V-71 diesel engines developing 189 ghp at 1800 rpm.

New Back-Up Rings

Parker Seal Co. has developed a line of continuous back-up rings for O-ring-in groove installations that are said to not only increase O-ring life and effectiveness but are quickly and easily installed, and are low in cost,—up to 50% less than normal types. Called Parbaks, these back-up rings are designed with a concave

shape to prevent O-ring extrusion and increase lubrication of the O-ring. They are continuous one-piece rings (without spiral or cuts). They thus avoid the possibility of cutting O-rings due to improper installation or worn back-ups. Complete technical data and other information may be had from Dept. BR-1, Parker Seal Co., 10567 Jefferson Blvd., Culver City, Calif.

ITS NEW



Test the AUTOLITE CO-AX on your own equipment in farm, marine, earth movers, trucks, cars, diesel and industrial engines...to check its many design advantages, its plus values.

Ring Replacement Data

Comprehensive and up-to-date set-up sheets for replacement piston rings designed specifically for virtually all of the popular industrial engines have been published by the Metal Products Division of Koppers Co., Inc. The set-up sheets were made in order to save owners and operators of industrial engines need-

less expense and delay in problems connected with replacement rings. Requests for this information should specify the make, model and type of service (diesel, natural gas, dual fuel, etc.). Koppers' engineers will then forward the recommended set-ups promptly. Interested parties should write to: Koppers Co. Inc., Piston Ring and Seal Department, 200 Scott Street, Baltimore, Md.

McEwen of Cooper-Bessemer Retires From Post

Retirement earlier this year of Lawrence G. McEwen, Gloucester, Cooper-Bessemer Northeast district sales manager since 1923, has been announced by George W. Edick, domestic sales manager. Mr. McEwen, who served in the First World War, was a U.S. Navy Cap-

tain for five years during World War II, and served Cooper-Bessemer customers from the company's Gloucester office continuously for 36 years, except for his periods of Navy duty.

British Order Outboards

American Marc, Inc., of Inglewood, Calif. announced that the British Government had ordered two of the company's diesel outboard motors for tests in connection with their possible use on small craft of the British Navy. The engine, which American Marc developed and produces, is the world's first diesel outboard motor. Production of the diesel outboard began in January. American Marc said that overseas orders for the diesel outboard had been received from Sweden, Kenya, Ghana, Mexico, Singapore and Ceylon. The firm announced that it was shipping its diesel marine outboards at the rate of ten a day, and would be shipping 4,000 a month by year end. President W. Denis Kendall said that shipments of the diesel outboard, which had been slowed by difficulties in obtaining the precision equipment necessary for the production of a completely new engine, would reach 2,500 a month by September. He said: "The diesel outboard, unlike other outboards, is not a seasonal item. It will have wide industrial application throughout the world, particularly in areas where diesel fuel sells for a fraction of the price of gasoline."

Production Road

They Set Their Traps at the Bottom of the Sea is the title of the feature story in *Twin Disc Clutch Co.*'s quarterly magazine, *Production Road*. The story deals with the crab fishing industry in North America. It describes how crabs are caught, how they are transported alive in special tanks, and how they are processed for marketing to consumers. Another *Production Road* story of interest is "The Bowdoin Saga", an account of Admiral Donald B. MacMillan's Arctic explorations in an 88 ft. wooden schooner. Other features: crawler tractor log-hauling operations in deep mud; railcar pulling in crowded loading terminals; curing alignment problems on oil field compressors. Copies are available on request from The Editor, *Production Road*, Twin Disc Clutch Co., Racine, Wis.

READY NOW! The completely new 1960 edition of the **DIESEL AND GAS ENGINE CATALOG**, Volume 25, can now be purchased. If you design, purchase, sell, operate or service diesel, dual fuel, or gas engines, the Catalog is essential to you and your business. This giant, 442 page, 10½ x 13½", fully illustrated reference book has been rewritten, revised and brought up to date completely from cover to cover and costs just \$10 postpaid anywhere in the world. Send checks, money orders or company orders to **DIESEL AND GAS ENGINE CATALOG**, 9110 Sunset Blvd., Los Angeles 46, Calif.

STARTING MOTORS

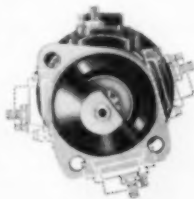
SO RIGHT! SO SIMPLE! SO LOGICAL!
First Revolutionary Advance in 25 Years!

MORE COMPACT. Shifting solenoid located inside pinion housing coaxially with shaft. No external parts interfere with engine or accessories.

MORE ADAPTABLE. Complete range of pinion sizes and mountings meet SAE standards, plus special adaptations for custom engine designs.

MORE VERSATILE.

Rugged one-piece pinion housing designed so that a flat for terminal and switch can be machined at any point on circumference. Results: almost unlimited mounting positions; one motor can be adapted to several different engines.



MORE PROTECTION. Motor and solenoid are enclosed...not exposed to dirt, water, snow or foreign objects.

EASIER SHIFTING. Solenoid, pinion and motor switch operate in a direct line. Provides accurate and reliable motor timing.

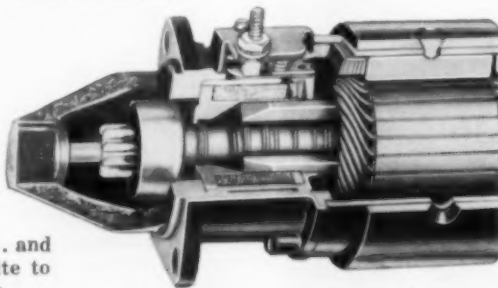
LONGER USEFUL LIFE. Positive and automatic engagement of pinion into ring gear with noticeable absence of engagement clash means less wear, greater length of service.

LESS SERVICING. Adequate bearings and lubrication reserves require no periodic maintenance.

PERFORMANCE RANGE. Co-Ax motors for diesel and large gas engines are conservatively rated on SAE standard and heavy duty battery curves as follows:

12 volt motors	2.4 hp, 28 lb. ft. stall ... to ... 3.6 hp, 44 lb. ft. stall
24 volt motors	2.8 hp, 35 lb. ft. stall ... to ... 6.5 hp, 78 lb. ft. stall

Smaller Co-Ax motors are also available with range of performance for automotive, agricultural and industrial engines.



Want to know more about Co-Ax Starting Motors ... and how they can simplify engine design for you? Write to Autolite, Electrical Products Division, Toledo 1, Ohio.

AUTOLITE



ELECTRICAL PRODUCTS DIVISION Toledo 1, Ohio

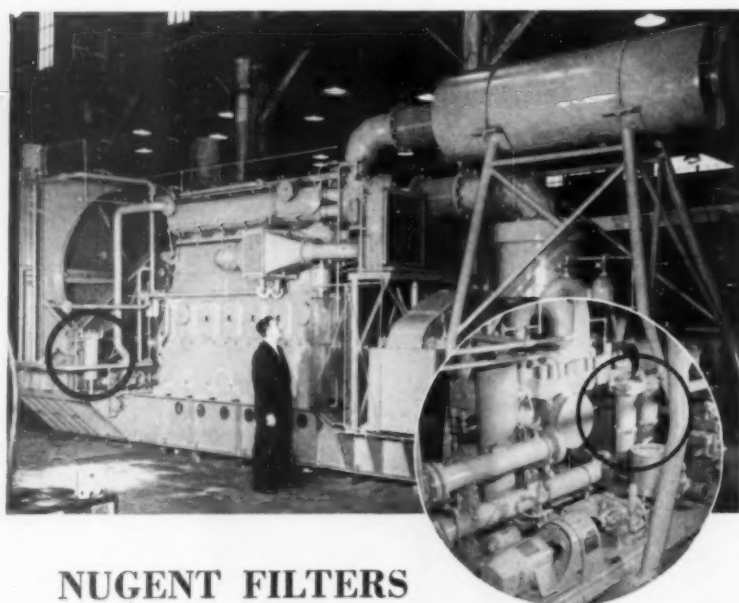
5 New Danish Ships

Shipowner J. Lauritzen has launched a new large-scale shipbuilding program under which 5 ships are to be delivered, all powered by B&W diesel engines. One of the ships will be a motor tanker of 38,000 tons dead-weight capacity—the largest yet to be built for the Danish merchant navy. The tanker is to be equipped with a 9-cylinder B&W diesel engine of the 74-VTBF-160 type, developing 13,500 bhp at 115 rpm. On loaded trials the tanker is to obtain a speed of 16 knots. It is to be built at Odense Shipyard and delivery is expected to take place in April, 1962. Aalborg Shipyard is to build a new arctic vessel of about 2,100 tdw. The ship will have accommodation for 36 passengers, and is to have a permanent helicopter deck. The main machinery will be an 8-cylinder B&W engine of the type 35-VBF-62 with a normal output of 2,240 bhp at 300 rpm. Three other arctic

vessels of 3,700 tdw. each are to be built in Holland. These will be equipped with 5-cylinder B&W engines of the type 50-VTBF-110, developing 2,900 bhp at 170 rpm, which will give the ships a speed of 14 knots.

New Plant to House Automatic Controls Division

The Cooper-Bessemer Corp., is constructing a new building to house its recently-formed En-Tronic Controls Division. The new building will house engineering, assembly and office facilities for the division. Groundbreaking ceremonies were held June 1, at Mount Vernon, Ohio, and the building is expected to be completed by October, 1960. Formed in January, 1960, the En-Tronic Division is being set up to handle complete systems engineering for precise control of engine and compressor units. Head of the new division is F. L. Friedli; Reed D. Hamilton is assistant manager.



NUGENT FILTERS serve diesel-driven pump in Sheikdom of Kuwait

Nugent lube and fuel oil filters provide maximum filtering protection for this skid-mounted pump package. One Nugent 1555-4S laminated fiber disc filter handles the lube oil for the 1000 HP Enterprise Diesel Engine powering the crude oil pump. Two 1555-4S units operating in parallel filter the heavy crude fuel oil consumed by the engine. The equipment is now in service in the Sheikdom of Kuwait on the Persian Gulf.

For safe, effective filtering protection . . . anywhere in the world . . . specify Nugent Filters. Wide range of types and sizes available. Write for literature.



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OIL FILTERS • STRAINERS • TELESCOPIC OILERS
OILING AND FILTERING SYSTEMS • OILING DEVICES
SIGHT FEED VALVES • FLOW INDICATORS

Mid-West Diesel News

By L. H. Houck

WESTERN Pipe Line, Inc., Austin, Texas, has its International TD-15 crawler equipped with two Lincoln welders working on a pipeline job near Lebanon, Pa.

KW-Dart Truck Co., Kansas City, shipped one of the first units of its new 40 ton, 2-axle dump truck to the Michigan Iron Range. These giant ore movers are 30 ft. long, 13 ft. high, 12 ft. wide. Power is V-12 Cummins with Twin Disc torque converter, tires are 18.00 by 33.

ONE hundred GMC diesel tractors to McLean Trucking Co., Winston-Salem, N. C., all with 6V-71's, aluminum cabs, half with sleepers, all COE's.

GATEWAY Transportation Co., La-Crosse, Wis., 131 International tractors, DCOT-405, with 195 hp Cummins diesels, 10-speed Fuller transmissions, pusher axles with V-belt drives.

TEN Kenworth Model K-825's with Cummins diesels to Moss & Meadows, Boise, Idaho, for lease to Armour Truck Lines. Tractors have sleeper cabs.

LEASED TRUCKS, Inc., Sioux City, Ia., 27 International diesel tractors with Cummins for reefer service—DCOF-405's.

MARION 35-M, 3/4 yd. shovel with Cummins 6 cyl. diesel to Virgil Smith Quarries, Belle, Mo., from Ryan Equipment Co., St. Louis.

INLAND GM Diesel, Inc., Milwaukee, delivered a GM 3-53 marine diesel to power a 38-ft. motor sailer, owned by C. E. Blomgren.

FIRST of new series FL-714 Deutz engines are in the field and dealer, Phoenix Auto Supply Co., Phoenix, Ariz., delivered two 12-cylinder engines for irrigation purposes. Diesels run at 1800 rpm and deliver 200 hp.

HOLIDAY-On-Ice, well known skating show, will have ice made by two Deutz A6L-514 engines, which were installed on the ice-making machines by Vilter Mfg. Co., Milwaukee. The sale was made especially for the troupe's African tour.

INLAND GM, Milwaukee, repowered a C-850 Ford with a 6V-71 GM diesel for William Huggins, Milwaukee truck operator.

OBSERVED: Voss Truck Lines, Oklahoma City, at Cuba, Mo., with one of its new International tilt cab tractors

with Cummins JN-6 diesel, Donaldson air filter, RoadRanger transmission, pulling 40 ft. refrigerator trailer.

RAY Rixman, Dodge truck dealer, St. Louis, has delivered several Dodge LCF trucks with Cummins diesels to Husmann and Roper Freight Lines, St. Louis.

VANCE Motor Co., Grenada, Miss., Dodge dealer, has checked up on one of his first sales of Dodge diesels—an NC900 with Cummins—to Geo. Seabury, Jackson, Miss. The unit has now logged 50,000 trouble free miles in 2200 mi. trips between Mississippi and California. Unit has a sleeper cab and floating tandem.

YODER Sand & Gravel Co., Elkhart, Ind., has a P&H power package working on a portable gravel plant. This unit has a 205 hp 6 cylinder, P&H diesel and 50 kw generator and is used to power a Baldwin-Lima-Hamilton 201E crusher through a Cotta reduction gear. Sale was made by Korte Bros., Fort Wayne, Ind.

KROGER Grocery & Baking Co., headquarters, Cincinnati, has added 40 GMC highway tractors to its big fleet. Units have tilt cabs, model DL7000, 6-71 GM diesels, and brings Kroger fleet of diesels to 309.

TWO Deutz A6L-514's to Young's Machine Co., in Monticello, Utah, for installation in Michigan front-end loaders.

SEVEN 40 ton end dump Mack diesel trucks with new model V-8 Cummins engines to Pierce Mine of the M. A. Hanna Co., Hibbing, Minn., for use in hauling iron ore.

INLAND GM, Milwaukee, delivered a 4-71 GM diesel to H. Hurlbert, Menomonie, Wis., for powering a sawmill.

TRI-City Power Co., Milwaukee, has installed a GM 4-53 diesel in a repowering operation on a Northwest crane. Sale by Inland GM Diesel, Inc., Milwaukee.

\$300,000 Navy Contract

American Marc, Inc., of Inglewood, Calif., announced the receipt of contracts totalling close to \$300,000 from the Navy's Bureau of Ships. The contracts are for the purchase of diesel-generator sets and spare parts for equipment previously supplied. The contracts were for 2.5 kw dc water-cooled generator sets; 2.5 kw dc air-cooled 28 volt Diesel generator sets; 2 1/2 kw 120 volt non-magnetic Diesel-generator sets; plus the necessary manual spare parts, water-cooled 10 kw diesel-generator sets, and parts for units previously supplied.

Flood Control, Harbor Projects To Be Considered

Action to hold down flood damages by helping local authorities obtain and provide accurate information so as to avoid unnecessary urban and industrial growth in flood areas, will be considered by the Senate Public Works Subcommittee on Flood Control and Rivers and Harbors. Also, the "Omnibus Bill" includes proposals for authorizing the Corps of Engineers to deepen an initial group of 17 Great Lakes harbors to St. Lawrence Seaway specifications, out of the total of some 50 such projects now under study. In addition, inclusion of 38 new rivers and harbors projects with the 43 previously approved by the House will be considered. Studies being made for the Senate Select Water Resources Committee indicate the need to avoid unnecessary exposure to certain flood damages where cities and industries are sprawling into areas frequently covered by high water. The proposal under consideration would authorize the Corps of Engineers and other Federal agencies to assist local authorities in working out "flood plain zoning" measures to limit improvements that could be built in areas prone to flooding. This would include advice as to the frequency, location and depths of possible future floods in localities requesting such assistance. The subcommittee is considering adding two more Great Lakes harbor deepening projects to the "Omnibus Bill". They are at Fairport, Ohio, and Trenton Channel, Detroit. Fifteen similar projects included in the bill as passed by the House were: Two Harbors, Minn.; Duluth-Superior Harbors 1 and 2; Ashland, Wisc.; Presque Isle and Marquette, Mich.; Calumet, Ill.; Indiana Harbor, Ind.; Toledo, Sandusky, Cleveland, Lorain and Ashtabula, Ohio; Erie, Pa.; and Buffalo, N.Y.

New Air Compressor

A new 20-page bulletin 175, just published by Clark Bros. Co., introduces the "Isotemp" packaged centrifugal air compressor line for air separation plants and industrial use. In addition to detailed engineering data which permits approximating horsepower requirements for various applications, the brochure incorporates illustrations and descriptions of all major design features, including multi-stage compression with high efficiency volutes and impellers; integral intercoolers mounted in the base; unique new water separators; single case design with side connections; integral bearing construction; isolated bearing chambers; back-to-back impellers; horizontally-split case; and drive-thru shaft. Clark Isotemp centrifugal compressors are built in six frame sizes with horsepower ranging from 1000 to 8000 bhp and cap-

acities from 5000 to 38,000 cfm. Copies of Bulletin 175 can be obtained by writing to Clark Bros. Co., Olean, N. Y.

(ITS NEW)

FAA Contract for White

The Diesel Engine Division of The White Motor Co. has received a government contract award of approximately \$1.2

million from the Federal Aviation Agency for 21 500 kw diesel generator sets to be used as power supply for airway air traffic control centers. The Engine Division contract award supplements an order for 9 units received earlier this year and brings the division's military order backlog to almost \$10 million, including diesel generator units for the Atlas, Nike-Zeus, and Mace missile programs.

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THERE'S A Clayton DYNAMOMETER FOR EVERY HORSEPOWER NEED



A Complete Line of CHASSIS DYNAMOMETERS

... from 150 to 800 rear wheel h.p.

Don't throw away any power built into your truck engine. Trucks operating at specified power get better fuel mileage and give better service. Only the use of a Clayton Chassis Dynamometer can assure *power proved performance*. Permits truck testing under actual driving conditions without leaving the shop. Simple to operate ... easy to install.

There is a Clayton Chassis Dynamometer to fill every requirement

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... from 5 to 6000 horsepower for testing gas or diesel engines

Clayton Engine Dynamometers and Universal Test Stands are designed for "run-in" and test of all types of gasoline or diesel engines, and power units equipped with mechanical clutches or torque converters. Quickly and accurately determines actual performance of new or rebuilt engines. Torque loads can be maintained indefinitely or changed at will. Engines installed in minutes ... automatic alignment.

There is a Clayton Engine Dynamometer Model to handle any engine



UNIVERSAL TRACTOR TEST EQUIPMENT

... FOR TESTING ALL POPULAR TRACTOR MAKES

Clayton Dynamometers can be used to test any tractor when used with Universal Tractor Test Equipment. Installed separately or in combination with the Universal Engine Test Stand, it provides complete facilities for testing engines without removing them from the tractor. Will also test tractors and heavy duty rubber tired construction vehicles equipped with power take-off drives, driving through mechanical transmission or torque converter.

There is Clayton Universal Tractor Test Equipment to test any tractor

Clayton MANUFACTURING CO.

443 N. Temple City Blvd., El Monte, Calif.

WRITE FOR FULL INFORMATION ON ANY OF THE ABOVE EQUIPMENT





SF 211 — Shown above, left, the all-purpose, single wire braid hose assembly suitable for universal industrial applications. Withstands temperatures from -40°F to 250°F .

SF 213 — Shown above, center, the lightweight single wire braid, fabric covered hose assembly designed for hot engine oil and fuel lines and many other applications. Withstands temperatures from -40°F to 300°F .

SF 224 — Shown above, right, the high temperature stainless steel wire braid covered Teflon hose assembly, designed for chemicals, petroleum or synthetic base lubricants, acids, solvents, steam service and hot asphalt lines. Withstands temperatures from -65°F to 450°F .



DURABLE • EASY TO INSTALL • REUSABLE FITTINGS



Both manufacturers and users of diesel equipment can rely on Stratoflex flexible hose and hose fittings to reduce downtime, speed replacements and hold maintenance costs to a minimum. Stratoflex hose has the proven durability that is necessary for dependable service. Stratoflex detachable and reusable fittings simplify maintenance and assure vibration-proof, leak-proof connections. Hose lines can be made up rapidly on the job, thus reducing costly downtime. For complete information on Stratoflex diesel-proved hose and fittings, write for Industrial Catalog 201.

SF9-0

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San Francisco, Seattle
Toronto, Tulsa

S. E. Johnson, Sr. Retires as Cooper-Bessemer V. P., Sales Director

Stanley E. Johnson, vice president and director of sales, The Cooper-Bessemer Corp., has announced his retirement after 42 years of continuous service. Mr. Johnson joined the Mount Vernon, Ohio firm in 1918, and was named assistant sales manager in 1932. In 1944, he was named acting sales manager, and the following year became a vice president and director of sales. He has been a director of the company since 1946, and will continue to serve in that capacity. Mr. Johnson served with the U.S. Marine Corps in World War I, and is a member of the American Petroleum Institute, and the Society of Naval Architects and Marine Engineers.



S. E. Johnson

Engine Product Manager

Louis B. Schultz has been appointed engine product manager, Engine-Material Handling Division, Allis-Chalmers Manufacturing Co., Milwaukee, Wis. Until recently he was O.E.M. engine sales manager for the company's Chicago branch. He has been with Allis-Chalmers since 1926,



L. B. Schultz

when he joined engine engineering at Harvey. R. L. Godfrey, who earlier this year was named distributor engine sales manager for the Chicago branch, has added O.E.M. sales responsibilities.

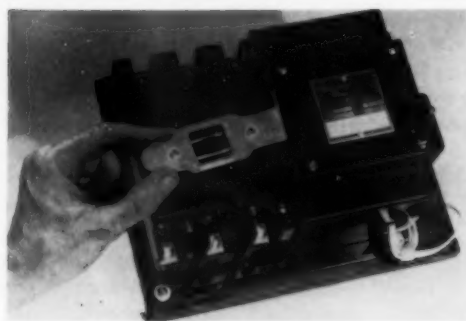
Gift Aids School

Engineering building fund of the University of Santa Clara received a pledge of financial assistance from the Western Gear Corp. Foundation, according to an announcement made by Father Patrick J. Donohoe, S. J., president of the university. The Western Gear Foundation has pledged \$125,000 which will be used by the university to aid construction of several new buildings for the engineering school. The photograph shows



Charles F. Bannan, (at right) president of the Western Gear Foundation, presenting Father Donohoe with the first payment. At left is Berchman A. Bannan, senior vice-president of Western Gear Corp. and a member of the board of regents of the University of Santa Clara.

New Electrical Operator



A line of electrical operators that allows type AB circuit breakers to be remotely controlled is now available from the Westinghouse Electric Corp. Models with rated control voltages of 120, 240, 480, or 600 volts ac and 125 volts dc can be supplied. They will actuate breakers rated to 100 amperes at 600 volts in frame sizes designated E, EH and F. The electrical operators can be used for a variety of remote control applications involving equipment such as engine generators, battery chargers, irrigation and oil field pumps, and lighting. They can also be used for capacitor-bank switching, as a limited duty motor starter, or as an overload sensing device. Breakers that are mounted on panel boards, switchboards, or bus-duct plug-in units can be equipped with the new electrical operators. For easy installation, mounting holes for the operators are identical in spacing and size to those for the breakers in all of the three available frame sizes. For back mounting, a special pin can be supplied. An electrical operator does not impair overload protector features of a breaker, nor does it prevent the breaker from being manually operated. For further information, write to the Westinghouse Electric Corp., P.O. Box 2099, Pittsburgh 30, Pa.

ITS NEW

American Marc Sales V. P.



L. E. Nelson

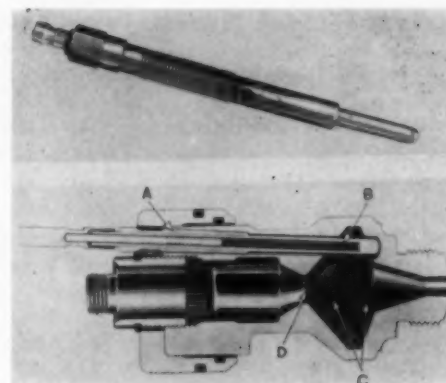
American Marc, Inc., has announced the appointment of Lawrence E. Nelson, a former vice president at Chrysler Corp., as executive vice president-sales. Mr. Nelson will be in charge of advertising, promotion marketing and sales. At Chrysler, he had been vice president of the

Marine and Industrial Division, since October, 1958. He first joined Chrysler in 1938. From 1948 to 1952, he was Central Branch Manager of the Dealer Development Division of the Ford Motor Company.

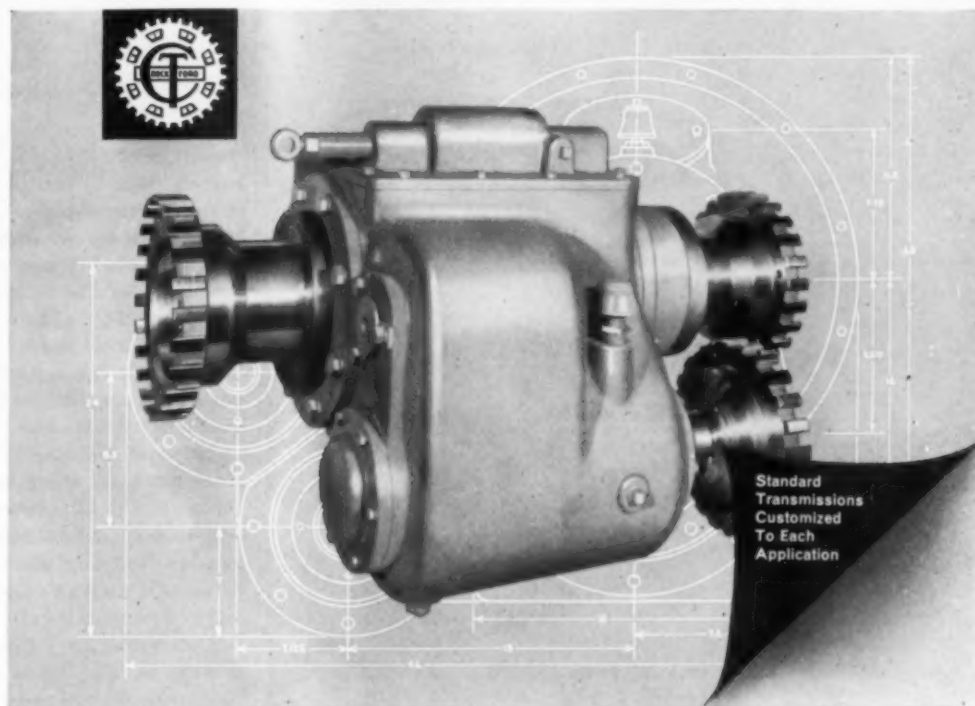
Diesel Engine Starting Aid

Small diameter Inconel tubing, supplied by Superior Tube Co., Norristown, Pa., is used as a sheath to protect the components of a cold weather starting aid for diesel engines. Known as Glow-Plug, the pencil-like device is custom-made by the General Electric Co. to screw into the combustion chambers of various makes of diesel engines and is sold through the manufacturers of the diesel-

driven equipment. To use the Glow-Plug, the operator of the equipment pushes a button on the dash and holds for one to three minutes. Power from the battery raises the surface temperature of the heating element in the Glow-Plug to 1800-2000°F., thereby heating the fuel to permit easy ignition. The metal sheath, which encases part of the heating element, must resist scaling at the high temperatures reached by the heating element and also embrittlement and attack by carbon deposits which may form in the pre-combustion chamber. These requirements are met by the Inconel tubing. A typical Glow-Plug is shown in the top photograph. In the schematic drawing beneath the photograph, a Glow-Plug with threaded Inconel sheath (A) is shown assembled in a diesel engine with the heating element (B) protruding into the



pre-combustion chamber (C). Fuel is being ejected from the spray nozzle (D).



Cotta split-shaft power take-off transmission

Use full engine power for truck travel or auxiliary equipment with Cotta split-shaft power take-off

Need truck mobility to transport auxiliary equipment quickly . . . *plus* full engine power for pumps, winches, electric sets, and compressors after they arrive on the job?

Cotta's split-shaft power take-off transmissions lead full engine horsepower to rear axles, or to auxiliary equipment when heavy loads demand it. Auxiliary engines can be eliminated. Reduced gear loads and constant mesh gears on both shafts prolong equipment life.

PTO flexibility — Standard truck transmission ratios combine with Cotta's split-shaft ratios to provide exceptional drive

flexibility for road travel or PTO performance. Customized gear-ratio variations are available for individual jobs.

Parts availability — Guaranteed Cotta parts and service keep your equipment on the job. Round-the-clock expediting of gears or shafts means delivery in hours after your order is received.

See our catalog in *Sweet's Product Design File*. Check the descriptions of standard and custom applications. Then call Cotta (TWX-RK 7720 or phone WO 4-5671) for complete details.

COTTA

HEAVY-DUTY TRANSMISSIONS

COTTA TRANSMISSION CO., ROCKFORD, ILL.



Florida Diesel News

By Ed Dennis

THE *Paraboots*, a Chris-built sports-fisherman, recently repowered by a pair of General Motors 4-53 diesels with a shp of 85 at 2200 rpm and 2:1 Warner r&r gears, made a record catch of a 1,100 lb. sunfish recently. The new diesels were supplied by Miami Branch of Detroit Diesel Div.

INTERNATIONAL crawler tractors, model TD15, which are powered with International D554 six cylinder 105 hp diesel engines, were acquired by Virgil Brown of Port Orange for land clearing. Brand Bros. Engineering Corp. of Boynton Beach and the City of Stanford for sanitary fill operation.

SIMPLEX Sales of Miami will supply the 350 kw model LRDBCSU Waukesha generating set for the North District

Hospital and a 500 kw model VLRDBU Waukesha set for the new Baptist Hospital.

THE model 4500 Manitowoc, currently used by L. C. Morris, road contractors, is powered by a model D397 Caterpillar diesel rated 440 hp at 1200 rpm. This 4½ yd. dragline also has a 5 kw Shepard diesel generating set for night work.

PORT Everglades Towing Co. recently took delivery of the 88 ft. tug *Everglades* powered with a GM Cleveland Diesel Div. 1600 hp diesel engine model 16-567-C. A sister ship with similar propulsion is currently under construction.

EDDIE Fuller's *Papa Bear*, is a new 10 wheel hiway Diamond T 931 tractor. This new air conditioned sleeper makes the 6800 mi. California round trip non-stop except for refueling. It is powered by a NH-220 Cummins, 6 cylinder diesel,

220 hp at 2100 rpm. Also included is a Lubber-finer filter, Bendix Westinghouse air compressor, Spicer aux. transmission and Fuller main transmission.

THE *Lucky Lady*, a 36 ft. party fishing boat at Hillsboro Inlet, was repowered by Ellis Diesel Engine Sales & Service, with two model 4-53 GM diesels and 2:1 Borg-Warner r&r gears for a top speed of 23 mph.

AT Punta Gorda, the Coast Line Construction Co. obtained five 360 Allis-Chalmers motor scrapers. These 20 yd jobs are powered by model TDS844 Allis-Chalmers 6 cyl. 280 hp 844 cu. in. disp. diesel engines. For push loading a HD20 crawler tractor with a 21000 turbocharged 225 hp Allis-Chalmers diesel, is used.

TWO Worthington, model SW14, diesel engines, rated 4190 hp at 450 rpm were recently installed and put on the line at the Marathon plant of the Florida Keys Electric Co-op, making a total of three of these V16 diesels. All engines operate on No. 6 fuel oil.

LAUNCHED on July 4th at Chris Boat Works on the Miami River, the *Norma*, powered by four cylinder General Motor diesels (4087-4088) each rated 151 hp at 2300 rpm and have 2:1 Paragon r&r gears and Perry water filters. Also included is a 3 kw one cylinder Onan generating set. The installation was engineered by Miami Branch of Detroit Diesel Div. for C. F. Sales of Jacksonville.

DOWN on the Florida Keys, Alonzo Cathron, contractors, received an International TD6 crawler tractor with a 50 hp International diesel and a No. 180 dieselized Galion road roller from Florida-Georgia Tractor Co.

AT Sarasoto, the Linke-Smith Construction Co. took delivery of three model HA3 Lister-Blackstone diesels to power Rainmaster jet pumps for jetting seawalls and bulkheads. Rated 500 gpm at 125 lbs pressure, the units came from Shelley Tractor & Equipment Co.

TWO Galion 12 ton road rollers powered by International UD-340 four cyl. 75 hp diesel engines to L. C. Morris Inc., road construction engineers from Florida Georgia Tractor Co.

FOR Station No. 8 of the Central and South Florida Flood Control Program, currently being built, four model 38 D 8½ five cyl. Fairbanks-Morse diesel engines and four Fairbanks-Morse 144 in. suction 5 ft. head, pumps.

AT Tampa, Cummins Sales Corp. repowered a Diamond T 723-C tractor

with the new Cummins C-180 turbo-charged diesel. This 4½x5 turbocharged engine is rated 180 hp at 2500 rpm. The installation was made for Dave Lasher of Largo.

DIESEL Shipbuilding at Jacksonville, recently launched the all welded 55 ft. twin screw, *Swiftwind*, for Swiftwind Inc. It is powered by a pair of General Motors turbocharged 6-71 diesel engines developing 300 hp each at 2300 rpm. Also included were G. M. 2:1 r&r gears.

AT Jacksonville, the Gibbs Corp., launched the 150 ft. menhaden fishing craft *Sea Ranger* for Mayport Fisheries Co., powered by a pair of D 387 turbocharged Caterpillar diesels and 3:1 Cat r&r gears. A D 311 series H Cat diesel generating set and a Cat D 315 for the fish pump were also included.

A Scoopmobile powered by a model 195 D L C Waukesha diesel engine, having a rating of 84 hp at 2000 rpm, for road contractor L. C. Morris.

Exide Appoints Dean

Oakley N. Dean has been promoted to vice president-manufacturing of Exide Industrial Division of The Electric Storage Battery Co., Philadelphia. Mr. Dean assumes responsibility for the manufacture of Exide batteries and associated products for material handling equipment, for electric utilities, for marine, aircraft, telephone and railway applications, for emergency lighting, and for many other industrial uses.

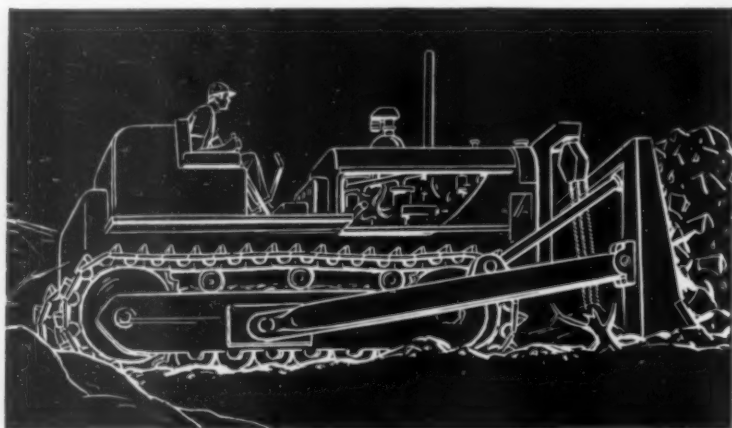
Sales Appointment

Clark Bros. Co. has announced appointment of James H. Bews as manager of its San Francisco branch office. Mr. Bews joined the Clark organization in 1951 and has served as technical service engineer, application engineer, and since 1957, sales engineer at the Clark Los Angeles District Office.

Stop and Go Bulletin

A bulletin, *Stop and Go Diesels*, has been published by the Cummins Engine Co. The 16 page booklet describes the economies of diesel engines in stop and go, light truck pickup and delivery applications and illustrates various applications using the engines designed for such service. In addition specifications and power curves on Cummins' 4-cylinder J-80 and C-105 and 6-cylinder JN-130 and C-160 engines are provided, along with a chart of horsepower requirements for various stop and go applications. Copies of the bulletin can be obtained by writing Cummins Engine Co., Columbus, Ind.

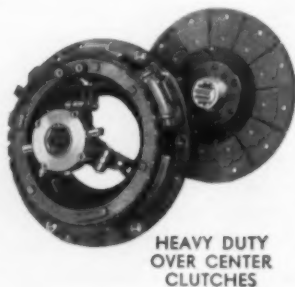
(ITS NEWS)



BETTER COMPONENTS... BETTER PRODUCTS!

Cooperation produces the final design

When each component part is the best, the whole machine is right. Rockford Over-Center Clutches are the finest made for crawlers, cranes and other heavy-duty equipment. If your equipment is in the design stage, let Rockford Clutch engineers help you select the best clutch. Rockford Clutches in standard sizes suit almost every need. Custom models can be designed for your applications. Call or write for the Rockford Clutch Catalog.



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Foote Bros., English Firm in Joint Venture

Foote Bros. Gear and Machine Corp., Chicago, and The David Brown Corp., Ltd., London, have established a jointly-owned sales subsidiary in Canada, it was announced by James R. Fagan, president of Foote Bros. Fagan said the new firm, to be known as David Brown-Foote Gears, Ltd., will take over sales and distribution in Canada of gear products manufactured by both companies, plus products of The Whitney Chain Co., a division of Foote Bros. The firm will also perform related manufacturing and assembly operations. David Brown-Foote Gears, Ltd., is owned jointly on a 50-50 basis by Brown and Foote. Fagan also announced that Foote Bros. has acquired the good will of the gear and reducer business of David Brown, Inc., San Leandro, Calif., sales subsidiary of David Brown Corporation, Ltd. The subsidiary has been West Coast sales agent for several product lines manufactured by Brown. At the same time, Fagan announced that Foote Bros. has been designated exclusive distributors in the U.S. for speed reducers and gear products manufactured by David Brown Industries of England, under an agreement with David Brown Corp., (Sales) Ltd., London.

66 New Facilities For Inland Waterways

The nation's industry constructed or announced plans to erect 66 new plant facilities along the navigable inland waterways during the first quarter of 1960, according to a recent survey by The American Waterways Operators, Inc. Figures released by the shallow-draft water carrier association indicate the petroleum and chemical industries led all other segments of the economy in the development of new plant facilities on waterside sites—including many in the Gulf Coast area where such expansion has been increasing in recent years. These two industry groups put into operation or began developing 26 production facilities in the first three months of this year. These represented 39 per cent of all new waterside plant facilities reported in the Association's survey. The first quarter figures for 1960 bring to 3,264 the total number of industrial plants and other facilities built along the inland waterways since AWO began keeping records on this matter in 1952. The latest figures show that 23 of the new waterside facilities developed so far this year are docks, wharves or terminals for handling barge commerce. In addition to the 26 petroleum and chemical plant facilities built or announced so far this year there were seven new barge terminals by public port authorities; five electric power generating plants;

four grain-handling and storage terminals; four paper plants; three steel mill installations; three plant facilities for construction materials; two non-ferrous metal units, and 12 projects for general manufacturing.

Turbines Ordered

Orders for 14 small gas turbine engines for ground support of German Air Force Lockheed F-104s have been received by The Garrett Corp.'s AiResearch Manufacturing division, Phoenix, Ariz. Four of the units will be delivered to Lockheed-Burbank MA-1A trailer mounted; the balance in enclosures for installation on MA-2 multi-purpose vehicles. The turbines are of the latest type currently in production for the United States Air Force. In operation they supply compressed air to start jet aircraft engines.

Turbine Powers New Preflight Check System

Solar Aircraft Co. is producing gas turbine-powered generator sets for a new electronic preflight checkout system developed by Republic Aviation Corp., it has been announced by France Q. Wilson, Solar manager of turbomachinery sales. The generator sets, powered by Solar's Mars 50 hp gas turbine engine, insure a continuous supply of high quality electrical current for the precision checkout system, said Wilson. The electronic system, dubbed RADFAC (Radiating Facility for Aircraft Flight Line Testing), permits Air Force fighter pilots to give their planes a complete electronic checkout in 90 seconds without moving from the cockpit. Republic designed the system for use with its F-105 jet fighter, but it may be modified for use with other aircraft. Upon a signal from the pilot, via a remote control unit, RADFAC runs an electronic check over the jet's communication, identification and navigation systems. It advises the pilot, verbally or by tone signals, whether the systems are in good working order. If anything is amiss, it pinpoints the trouble. Solar's generator set and controls supply current for the unit or monitor the current supply when an outside source is used. In the event either the voltage or the frequency of the current supplied by the outside power source should fluctuate beyond established limits, the controls cut off the outside current supply and start the gas turbine generator set. The entire switch over is rapid, enabling the checkout of the aircraft to continue uninterrupted. The RADFAC system with its gas turbine power supply is mounted in a trailer weighing 4,400 lbs., completely outfitted and occupying 247 cu. ft. It replaces a large array of equipment usually required to check these systems in military aircraft. The trailer can be transported by air.

Exide Advances Wells

Leland E. Wells, former director of engineering of Exide Industrial Division of The Electric Storage Battery Co., Philadelphia, has been promoted to vice president-engineering of the division. He previously held positions as director of research and engineering and chief engineer for the company that manufactures Exide industrial batteries.

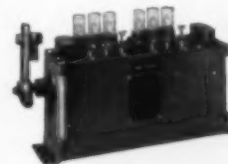
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Detroit Tug Race

Color, crowds and competitive spirit marked this year's June running of the annual International Tugboat Race on the Detroit River. It occurred this year as a feature in the International Freedom Festival, a week-long celebration honoring the independence of the U. S. and Canada. Finishing first in the event was the 1000 hp tug, *Superior*, which pushed over the finish line opposite downtown Detroit just feet ahead of a sister ship, the *Maryland*. The contest offered one of the most exciting wrap-ups in the event's history. Both tugs are owned by the Great Lakes Towing Co. of Detroit. Other winners in their class were the *Atomic* owned by the McQueen Lts. of Amherstburg, 600-900 hp; G. F. Becker of Detroit, owned by Frank Becker Towing Co., 300-600 hp; and the *Ethel S.*, owned by the E. C. Korheffek Co., Trenton, 100-300 hp. The *Superior* romped home in exactly 15 minutes

after the start, cutting 1½ minutes from last year's winning time. The tugboat skippers attributed the new winning time to a hearty stern wind.

CIMAC Conference 1959 Report Now Available

The official report of the CIMAC-Conference 1959 Wiesbaden has been published. The report contains all speeches and lectures of the inaugural meeting and of the closing session and the list of participants and of members of the different committees and all papers with illustrations and results of the discussions in the language of the author and the speaker. It will be printed on art paper, have cloth binding and approximately 1100 pages. Send purchase orders to Maschinenbau-Verlag, GmbH, Frankfurt/Main, Barckhausstr. 16, West Germany. The price is DM120, postage and packing are extra. Persons interested in receiving individual papers can obtain a list of the paper from the above address.

Engine-Generator Bulletin

A new bulletin describing a complete line of engine-driven electrical generating systems in the range of 10 to 200 kw is available from Consolidated Diesel Electric Corp. Included in the catalog is the firm's Uninterrupted Power Supply for critical applications where even a few seconds' interruption in electrical power cannot be tolerated. Condec's UPS automatically assumes the load without interruption when normal power fails. Normal voltage is restored within 1.5 milliseconds. Diesel generators are available from 10 to 200 KW for use either as primary sources of electrical power or as standby emergency power supplies. Copies of bulletin P-1 are available from Power Equipment Division, Consolidated Diesel Electric Corp., Stamford, Conn.

ITS NEW

Indicating Controller

The Bristol Co. has released a Bulletin DMO58 describing Bristol's new series 624 indicating pneumatic controllers. The new A/D control unit is featured. Specifications for the instrument are given, and models are listed for controlling pressure, vacuum, liquid level, flow, temperature, and humidity. Rapid response makes the 624 suitable for controlling pressures subject to quick changes and it is also applicable for alarms or selective action for oil temperature-pressure controls. Request bulletin DMO58 from the company at Waterbury 20, Conn.

Hydrofoil Boat

AiResearch will contribute to "the most significant marine advance in 50-years," according to the U. S. Maritime Administration. Two seagoing small gas turbines built by The Garrett Corp.'s AiResearch Manufacturing Division will start and supply electricity for a powerful new hydrofoil boat. The 104-foot-long craft, capable of 80-knots on the open seas, is being built for MARAD by Grumman Aircraft's Dynamic Developments. Scheduled for launching early next spring, the 80-ton, all-aluminum hydrofoil will use two AiResearch GTCP 85-91 turbines equipped with special, light aluminum housings. These units will pneumatically start the aircraft-type turbine prime mover which skims the craft through the water on two sets of foils. Once their task of spinning the main jet power plant to life is completed, the AiResearch turbines will turn to the task of generating all electrical power needed to operate the boat. The boat relies extensively on aircraft-type construction. In operation, a set of foils in the water just forward of the craft's center of gravity will "fly" the boat hull above the water. Another set of smaller water-foils well aft provide stability and high speed maneuverability.

Autocar Promotion

Autocar Division of The White Motor Co. has named Lee J. Perme assistant to Karl A. Roesch, vice president of The White Motor Co. and general manager of the Autocar Division. Perme has been in the White Motor organization since September, 1953, when he joined the Cleveland branch sales staff. He became an attorney in the legal department of White in 1955 and in May, 1959, was named as assistant secretary of the White Motor Corp., a position he held until moving to the Autocar Division.

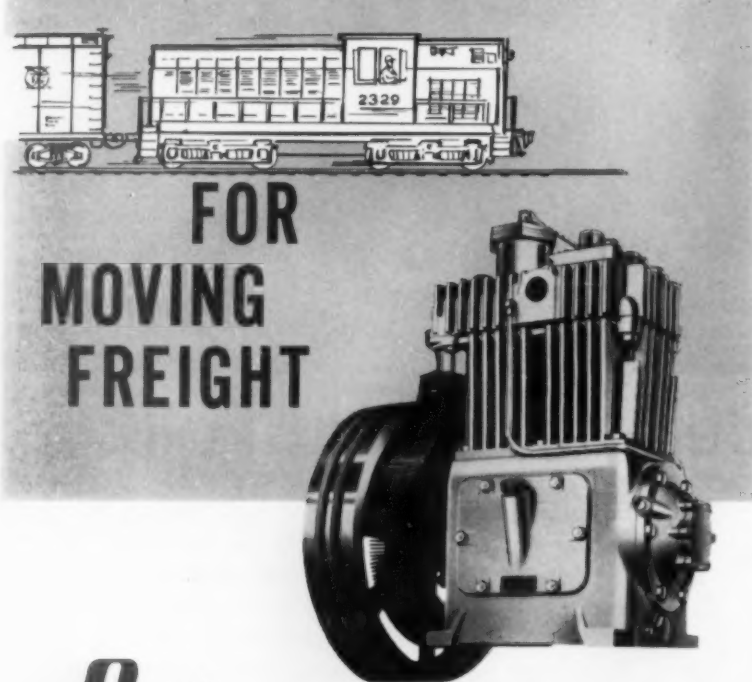
Transmission Data

A detailed breakdown of the makes and types of transmissions used by Class I and II carriers is featured in Volume 9, Number 3, of *Transmission Topics*, published by Fuller Manufacturing Co. The magazine also spotlights election of Fuller President E. L. Ludvigsen to the board of trustees of Tri-State College, Angola, Ind. Also included in the current issue are instructions for the operation of Fullair Control, a list of gear ratios available in Fuller's line of 16 three-speed auxiliary transmissions and the conclusion of Eaton Manufacturing Company's analysis of truck axle failures. Trucking operations featured in *Transmission Topics* include Campbell "66" Express, Springfield, Mo.; Dallas Leasing Company, Inc., Dallas; John Gebhart, Indianapolis, and Harmony Blue Granite Co., Inc., Elberton Georgia. Off-highway users of Fuller Transmissions included in the magazine are Hubbard Construction Company, Orlando, Florida, and Vinson & Hodkin Construction Company, Denham Springs, Louisiana. Equipment manufacturers featured include Allis-Chalmers and The Warner & Swasey, Cleveland. A copy of *Transmission Topics* may be obtained from Fuller Manufacturing company, Transmission Division, Kalamazoo, Mich.

American Marc, Inc. Forms International Division

American Marc, Inc., announced formation of an International Division to license overseas manufacturers to produce and market the company's boats and diesel engines. At a press conference in New York, W. Denis Kendall, president of American Marc, said that formation of the division was prompted by the increased demand for American fiberglass boats in Europe, and the interest in the company's diesel outboard

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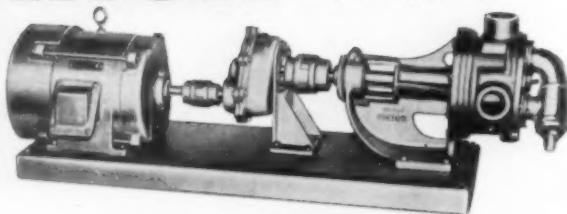
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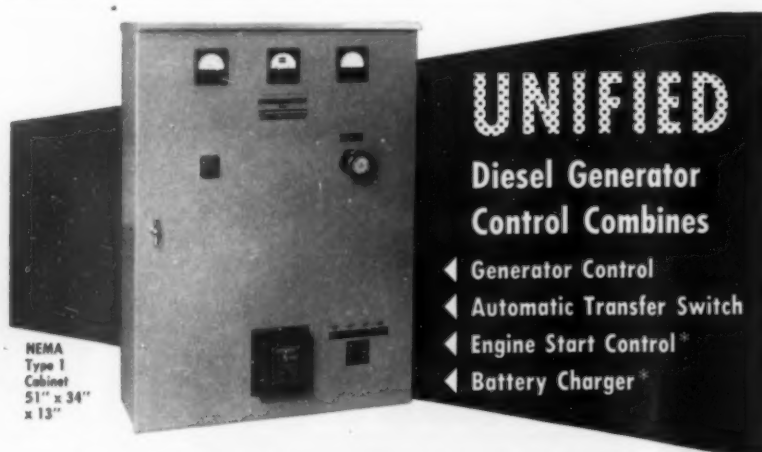
Cedar Falls, Iowa, U.S.A. In Canada, it's "ROTO-KING" Pumps

See Our Catalog in Sweet's Industrial Construction and Plant Engineer's File

F-M Export Assistant

Carl W. Batkay has been appointed Assistant Sales Manager of the Fairbanks, Morse & Co., Export Division, it was announced by William J. Marcellus, general manager of the division. Division headquarters are in Fair Lawn, N.J.

Mr. Batkay's new post is a promotion from his position as manager of the Diesel Engine Department in the Export Division. Mr. Marcellus appointed John E. Clark, Jr., as Manager of the Diesel Engine Department to succeed Batkay. Mr. Clark joined the Project Department of the Export Division in 1956.



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- ◀ Generator Control
- ◀ Automatic Transfer Switch
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* Engine Start and Battery Charger optional.

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Inland River Reports

By A. D. Burroughs

HUMBOLDT Boat Service, St. Louis, is giving final inspection touches to the shuttleboat for Hutchjohn Towing, Inc., Wilmington, Del. Named *Little Hutch*, the 32x10 ft. vessel will serve in the Monongahela River oil trade with 170 hp delivered from a GM Detroit model 6-71 engine.

ATCO, a near-twin to the *Little Hutch*, is another recent production from the Humboldt yards. This craft is in service for the Allgire Tug Boat Co., St. Louis.

TWYLA MARGE, new 65x24 ft. towboat completed by Barbour Metal Works, St. Louis, is on the Missouri River with push-power supplied from two cylinder model 397 Caterpillar engines. The craft works under a joint ownership plan for Luhr Bros. Construction Co., and Midwest Construction Co.

THE "big boat" category gets a boost with the planned September delivery of the twin-screw towboat, *Mississippi*, from the Ingall Pascagoula (Miss.) yard. The big 216x48 ft. vessel, equipped with Nordberg engines, will replace two steamers for the Mississippi Valley Division Engineers, Vicksburg area.

THE first of two 190 ft. twin-screw towboats for American Commercial Barge Lines will get an October christening at Jeffersonville (Ind.) Boat and Machine Co. Four Alco diesel engines, two to a shaft, turn propellers through Western Gear twin-pinion reverse-reduction gears.

THE summer season brings out the seasonal excursion and showboat crafts, all in tow by diesel-equipped vessels. The *F. H. Johnston* was using her 900 hp developed from three Cummins engines to push the excursion barge, *Chaperon*, on the Upper Ohio.

MAMMOTH Cave (Ky.) vacationers delight in the *Miss Green River*, 52x14 ft. excursion boat operating under its own power supplied from Gray diesel engines. The craft is operated by Capt. M. E. Nash, Park City, Ky.

ON the Ohio, the Ohio River Co. fleet was active towing empties in the slowed coal trade. We spotted the *Walter C. Beckjord* (3240 hp) and the *City of Huntington* (2160 hp) performing with their Baldwin-Lima-Hamilton push power.

THE four-year-old *Etta Marie*, built at Greenville (Miss.) for Port City Towing

Co. was up on the Ohio. The comparatively small 72x24 ft. towboat is equipped with three Cummins engines for a rated 1800 hp.

WAVERLY, tug-towboat of the Sioux City fleet returned to the Ohio after some absence. Built in 1956 by Parker Brother Shipyard, Houston, the compact 90x26 ft. modern craft is equipped with a pair of Enterprise engines for a rated 1000 hp.

ANOTHER diesel performance record has been turned in by the 8500 hp *United States*. This powerful towboat logged a billion ton-miles of service for owners Federal Barge Lines in 404 days. Four Cooper-Bessemer engines give the propulsion power.

ON the Flint River, the *Linda Brooks* is a "regular", with 1600 hp developed from twin Superior engines. Completed in 1958 for Brooks Liquid Transport, Chicago, this unique craft is equally versatile on lake, river, and canal service.

GM Diesels on Fork Trucks

General Motors Series 371 diesel engines are now available as optional equipment on six heavy-duty Clarklift fork trucks manufactured by Industrial Truck Division of Clark Equipment Co. The six trucks have capacities from 15,000 through 40,000 pounds. GM's model 3057C (Series 371) is a two-cycle, three-cylinder engine with a total displacement of 212.8 cu. in. and rated 118 bhp at 2300 rpm. This engine is available on all six trucks. On CY 350 and CY 400 trucks of 35,000 and 40,000 lb. capacities, GM's model 4057 C (Series 471) engine is also available for applications requiring higher horsepower than the 3057C engine. Model 4057C is a two-cycle, four-cylinder engine with a total displacement of 283.7 cubic inches and a rated brake horsepower of 167 at 2300 rpm.

Clark Sales Appointments

Clark Bros. Co., one of the Dresser Industries has announced the following sales appointments for the Houston-Corpus Christi area: Stewart L. Babbitt formerly service manager-Houston named sales engineer for the same office. In his new position, Babbitt will assist in handling the sale of Clark engines, compressors and gas turbines for the Houston district. G. M. Woodman, formerly small engine salesman for the Corpus Christi area has been assigned to the Houston district in the same capacity. C. R. Apitz, formerly special representative, gas turbines-Dallas has been assigned to the Clark Houston office as senior sales engineer. F. J. Shaw, application engineer, Houston, named sales engineer for the Corpus Christi area.

Michigan-Ohio News

By Jim Brown

THE city of Roseville, Mich. has recently accepted delivery on a Galion Model T-500 grader powered by a Cummins JN-6-BI diesel engine. Sale was made by Wolverine Tractor & Equipment Co., Detroit and Grand Rapids.

TELFORD Equipment Co. of Detroit has sold two model "D" Tournapulls to John F. Walser of Pontiac, Mich. Power is by GM 4-71 diesel engines, and they will be used for industrial site preparation.

J. R. PANELLI Equipment Co., of Southfield, Michigan recently delivered a model 1000 Case crawler-dozer powered by a Continental JB-382 diesel engine to Fenton & Raymond of Memphis, Mich.

DUNBAR & Sullivan of Detroit has accepted delivery on a 25 kw dc generator set powered by a GM model 20150 diesel engine. Sale by Peninsular Diesel Inc., of Detroit.

CUMMINS Diesel Michigan Inc., of Dearborn, Mich., has repowered a 3/4-yd. Bucyrus-Erie Model 22 shovel with a Cummins JN-6-IP diesel engine with a Twin Disc model SP-111-HP3 power

takeoff. Repowering work was done for Otisville Stone Co., of Otisville, Mich.

CYRIL J. Burke, Inc., of Detroit recently sold a Pettibone-Mulliken model 125 AD (1 1/2-yd) front end loader powered by a GM 3-71 diesel engine to be used on various paving jobs for Columbia Construction Co. of Livonia, Mich.

BESTWALL Gypsum Co. of Grand Rapids, Mich., has a Hough H-70 Payloader powered by a Cummins JN-6-BI diesel engine. Sale was made by the Grand Rapids branch of Wolverine Tractor & Equipment Co.

DUANE Tibbits of Birmingham, Mich., has accepted delivery on a Case model 1000 crawler-dozer powered by a Continental JB-382 diesel engine. The sale was made by J. R. Panelli Equipment Co. of Southfield.

HYDRAULIC Concrete Breaking Co. of Detroit has received their sixth Oliver—a model 880 Hydro-trencher with 1/2-yd. backhoe and Hercules diesel engine. The new Oliver, for miscellaneous excavating jobs, was purchased from Cyril J. Burke, Inc. of Detroit.

EARLE Equipment Co. of Detroit has sold an Allis-Chalmers HD11E diesel tractor with a hydraulic angle dozer attachment and fully enclosed cab. The unit was purchased by the city of Muskegon.

JAMES House & Sons of Essexville, Mich. has purchased two Cummins C-160-B (naturally aspirated) diesel engines for repowering Diamond T Model 900 trucks. The engines were purchased from Cummins Diesel Michigan Inc. of Dearborn, Mich. and will be used on a cement haul.

A Pettibone-Mulliken model 12 grader was recently sold to Columbia Construction Co. of Livonia, Mich. The new grader is powered by a GM 3-71 diesel engine; is equipped with a torque converter, speed-matic transmission and creeper gears. Sale was made by Cyril J. Burke, Inc. of Detroit.

WOLVERINE Tractor & Equipment Co. has delivered a Galion model T-600 motor grader with Cummins JNS-6-C to Manistee County, Mich.

GREAT Lakes Steel of Ecorse, Mich. has accepted delivery on two Allis-Chalmers Tracto-loaders. One is a model TL12D equipped with a 1 1/4 yd. bucket—the other a model TL14D with 1 1/2-yd. bucket and a backhoe attachment. Sale was made by Earle Equipment Co.

RAYMOND Excavating Co. of Marysville, Mich. has accepted delivery on a

new Case W-9 1 1/4-yd. loader with 4-wheel drive and powered by a Case D-301 diesel engine. Unit was purchased from J. R. Panelli Equipment Co.

A 35-ton Plymouth locomotive has recently been repowered for The Andersons of Maumee, Ohio. The job was done with a Cummins NRT-6-BI diesel engine incorporating a Twin Disc torque converter. Engine supplier is Cummins Diesel Michigan Inc. of Dearborn, Mich.

A Bros model SP-730B 30-ton roller powered by a 6 cylinder 130 hp Cummins diesel engine was recently sold to Ann Arbor (Mich.) Construction Co. by Cyril J. Burke Inc. The Bros roller is a self-propelled pneumatic unit with hydraulic steering and torque converter.

ST. JOSEPH County Road Commission has accepted delivery on a Galion model 104 motor grader powered by a GM 3-71

diesel engine. Sale was made by Wolverine Tractor & Equipment Co.

CONTINENTAL-Kromis Engine Sales & Service of Detroit reports the installation of a Continental model TD-6427 (146 hp) in a Dodge haul-away tractor. Installation was done for Oscar Summers of Albion, Mich., a broker who drives the haul-away between here and Arizona for Dallas & Mavis.

MISSAUKEE County road commission of Lake City, Mich. has accepted delivery on a Galion model T-500 motor grader. The grader is powered by a Cummins JN-6-BI diesel engine and was sold by Wolverine Tractor & Equipment Co.

Parker Sales Post

Appointment of William E. Ballantyne as assistant sales manager, Parker Hydraulics Division, Parker-Hannifin Corp., Cleveland, Ohio, has been announced.

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Models from 40 to 500 hp. Gas or Diesel.

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Harbormaster Marine Tractors permit simplified hull design, more cargo space, and more efficient crew operation. Outboard propulsion eliminates deadwood, stuffing boxes and rudder drag, and makes possible the use of a larger propeller, located farther aft of the hull. The result is more actual delivered thrust per H.P. than the same engine with an inboard system.

The advantages of Harbormaster Outboard Propulsion and Steering . . . shorter trip times and exceptional maneuverability and versatility . . . have been proved in hundreds of installations.

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Special elevating mechanism allows one-man operator to raise entire submerged assembly.



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West Coast News

By James Joseph

TO Wagner Tractor, Inc., Portland, Ore., an undisclosed number of Deutz air-cooled F6L-712 diesels (78 hp at 2300 rpm) for Wagner-made mine scoops.

GALLAGHER & Burk, Inc., Oakland, Calif., has taken delivery of a Caterpillar D315 turbocharged diesel electric set (50 kw at 1800 rpm) for powering a rock conveyor in the company's Hayward (Calif.) quarry.

FOR construction power on the Oroville-Wyandotte project in Calif., a Caterpillar D397 industrial diesel, purchased by Guy F. Atkinson Co., South San Francisco. Sale by San Leandro, Calif.'s Peterson Tractor Co.

TO Potlatch Forests Inc., Washington, six Allis-Chalmers 21000 turbocharged engines (340 hp at 2000 rpm) to re-power off-highway rigs. Sale by Pacific Fishing & Trading Co., Seattle.

PACIFIC Fishing & Trading Co. also reports conversion of a number of 4 and 6 cylinder Ford diesels to marine engines, tabbed Western Ford Diesels.

DELIVERED: by Hamilton Engine Sales, Inc., Portland, to Lige Dickson Construction Co., Tacoma, Washington, an Allis-Chalmers 21000 package torque converter with Clark 16:1 converter, governor and heat exchanger... for installation on a Model 54-B Bucyrus shovel.

A 200 kw, 21000 Allis-Chalmers generator set for Kaiser-Raymond-Macco-Puget Sound construction companies' job at Mountain Home, Idaho.

SOLD: to Young's Machine Co., Monticello, Utah, two Deutz A6L 514s (110 hp at 2000 rpm) for repowering Michigan front-end loaders.

TO W. R. Chamberlin Co. for use on its vessels, *Alaska Seaway* and *Alaska Spruce*, four 15AKCOP Clark converters.

A 8DAS-1125 Allis-Chalmers (350 hp at 2100 rpm) with 17CKO Clark converter to Montag-Halverson, McLaughlin & Associates, for John Day Dam project on the Columbia River.

TO Coast Oyster Co., a Caterpillar marine electric set (1800 rpm) with Electric Machinery 100 kw generator, installed in hydraulic oyster dredge working near Eureka, Calif.

SOLD to: the National Park Service as prime power for air-conditioning and

lights in Death Valley, Calif., a Caterpillar D387 (300 kw at 1200 rpm) diesel electric set. By Peterson Tractor Co.

FOR the motor ship *Schooner Northern*, a 21000 Allis-Chalmers marine diesel. Sale by Pacific Fishing & Trading Co.

ANOTHER 21000-series has been installed in the new purse seiner owned by Seattle's Harold Hanson.

TO Children's Hospital of the East Bay, Oakland, Calif., a Caterpillar D337 diesel electric set (1800 rpm) with 200 kw Kato generator as standby unit.

SOLD: two 12-cylinder Deutz F12L 714 (290 hp at 2300 rpm) units for irrigation pumping by Phoenix Auto Supply Co., Phoenix, Arizona.

PACIFIC Cement & Aggregates Co., Davenport, Calif., has taken delivery of a Caterpillar D337, replacing electric power on a Bucyrus-Erie 54-B shovel used in limestone quarrying.

FOR the motor vessel *Evening Star*, an Allis-Chalmers 21000 marine diesel, a re-power unit.

FOR standby use, to Andrews Equipment Service, Spokane, a 200 kw, 21000-series package generator set, with American Bosch fuel pump and governor.

THREE in-town gas rigs have been dieselized—and put on over-highway service—by California Motor Express, the conversion engines Cummins' model C160 (160 hp at 2500 rpm), installed in model 743 GMC tractors. Sale by Los Angeles' Cummins Service and Sales, Inc.

Compressor Bulletin

A new illustrated Bulletin 187 published by Clark Bros. Co., details mechanical and hydraulic design considerations for two stage centrifugal pipeline compressors. Discussion outlines growth in compression ratios of pipeline boosters from 1.10 per impeller to ratios of 1.50 per impeller and higher. Study then shows how an ever increasing compression ratio per single impeller becomes undesirable, based on certain fundamental considerations such as specific speed, slope of the characteristic curve (with its relationship to hydraulic design efficiency), stability, and internal gas friction losses. Brochure concludes with a description of the new Clark two stage centrifugal pipeline compressor in the light of these criteria together with modern day requirements for expandability from high head—low flow to low head—high flow operation. Copies of Bulletin 187 complete with charts, diagrams and important calculating formulae can be obtained by writing to Clark Bros. Co., Olean, N.Y.

ITS NEW

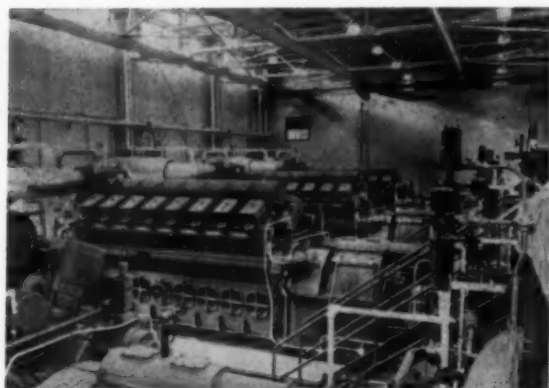
Elect Mc Queen to Rail Hall of Fame

One of America's pioneer locomotive builders, Walter McQueen, has been elected to membership in the Railroad Hall of Fame at Los Angeles, Calif. Appointed chief engineer of the Schenectady Locomotive Works in 1852, McQueen became vice president of the company in 1876 and served as such until his death in 1893. Locomotives built here for many years during that period were known as the "McQueen Engine." The firm became the American Locomotive Co. in 1901, and in 1954 the name was changed to Alco Products, Inc. to reflect the diversification of products manufactured. Election of McQueen to the Hall of Fame "in recognition of his achievements in railroad development" was announced by C. J. Keenan, who founded the institution in 1950 and is secretary-treasurer of the non-profit, educational corporation which operates it. Presently the Railroad Hall of Fame is located in a Pennsylvania Railroad car at Travel Town in Los Angeles. Construction of a museum to house train lore is being planned. Four other distinguished railroaders elected this year were Peter Cooper, who built the first successful American locomotive; Collis P. Huntington, builder of the Chesapeake and Ohio Railway and one of the

"Big Four" builders of the Central Pacific Railroad; Frederick J. Kimball, foremost builder of the Norfolk and Western Railroad, and Henry H. Rogers, builder of The Virginian Railway. Other members of the Hall of Fame are Abraham Lincoln, Colonel John Stevens, Horatio Allen, Cyrus K. Holliday, General Grenville M. Dodge, James Jerome Hill, John W. Garrett, Theodore Judah and George Westinghouse.

At Power Conference

David A. Hamil, administrator of the Rural Electrification Administration, participated in a technical session of the World Power Conference, held in Madrid, Spain, in June. A member of the U.S. delegation, Hamil presented a discussion topic on factors affecting the use of electricity in rural areas, as related to forecasts of energy requirements. General subject of the 13th biennial sectional meeting of the conference was "Methods of Solving Power Shortage Problems," with emphasis on each nation's long-term supply of energy needs. Formed in 1924, the World Power Conference is a non-government organization, with headquarters in London. It is one of the oldest international technical conferences in the world, and it is devoted to development and peaceful use of energy resources.



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Perfect Circle Changes

C. E. McTavish, since 1951 president of The Perfect Circle Co., Ltd., Don Mills, Ontario, Canada, has retired from the presidency and has been elected chairman of the board. W. Blake Dodds, formerly vice president and general manager, has been elected president and general manager.

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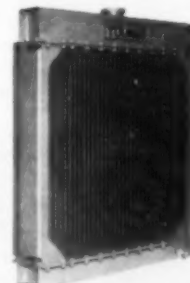
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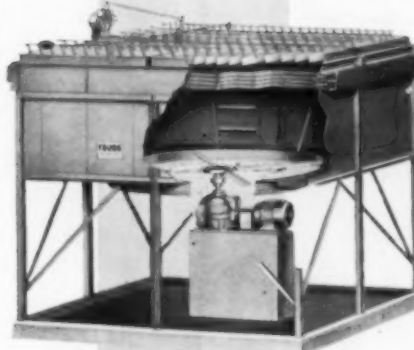
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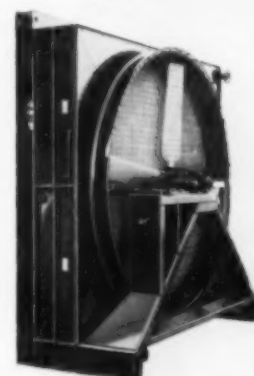
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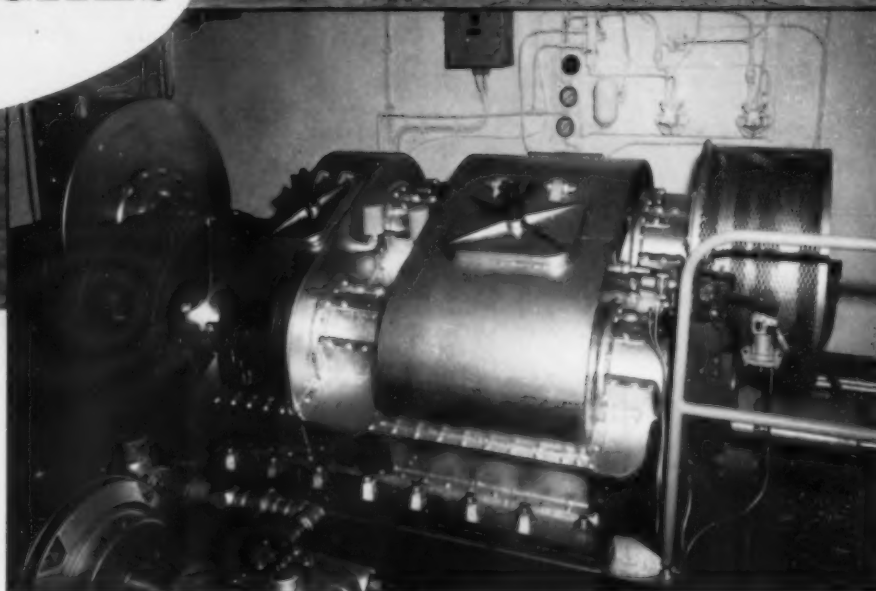
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